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ABSTRACT

This review is intended to assist guidance counselors, vocational and special education teachers, administrators, researchers, and vocational education evaluators in making decisions about implementing or improving vocational assessment programs. In the introduction, the legislative mandate for and history of vocational assessment of special students are discussed. The next section deals with the following service trends affecting vocational assessment in education: vocational evaluation in rehabilitation, the school-to-work transition, functional community-based special education, supported employment, and the Carl D. Perkins Vocational Education Act in relation to vocational assessment of special students. Approaches to and the purposes of vocational assessment for vocational education, the theory of environmental adjustment, categories of vocational adjustment information, analysis of vocational programs, and individual vocational profiles and their constructs are covered in an examination of a conceptual framework for decision making in vocational assessment. Criteria for vocational assessment methods and techniques for assessing vocational choice, vocational skills and abilities, learning style and potential, and special needs are explained. Specific procedures for using vocational education are discussed as are the implications of and recommendations for vocational assessment. An individual vocational profile and nine-page reference list are appended. (MN)

IN 327

Vocational Assessment of Special Students for Vocational Education: A State-of-the-Art Review

By
Michael Peterson

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VOCATIONAL ASSESSMENT OF SPECIAL STUDENTS FOR VOCATIONAL EDUCATION: A STATE-OF-THE-ART REVIEW

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FOREWORD

The Carl D. Perkins Vocational Education Act requires that vocational educators assess the interests, abilities, and special learning needs of each special needs student regarding successful completion of the vocational education program. *Vocational Assessment of Special Students for Vocational Education* provides a resource for responding to this mandate.

This synthesis paper presents the state of the art in vocational assessment. Recent literature reviewed includes program descriptions, models, guidebooks and guidelines, and research results. Guidance counselors, vocational and special education teachers, administrators, researchers, and vocational education evaluators can use this review in making decisions about implementing or improving vocational assessment programs.

The profession is indebted to Michael Peterson for his scholarship in preparing this paper. Dr Peterson is Associate Professor, Department of Counselor Education, and Director, Rehabilitation and Vocational Special Needs Education, at Mississippi State University.

Debra Neubert, Assistant Professor, Department of Special Education, University of Maryland; Patricia Sitlington, Consultant in Career/Vocational Education for the Handicapped, Iowa Department of Education; and Louise Vetter and James Weber, Senior Research Specialists, National Center for Research in Vocational Education, contributed to the development of the paper through their critical reviews of the manuscript. Wesley E. Budke, Senior Research Specialist, coordinated the paper's development, assisted by Ruth Gordon, Program Associate, Laurian Miguel, Program Assistant, and Catherine Thompson, Publications Specialist. Marjorie Dellinger, Clarine Cotton, and Abigail Hurd provided clerical support; Janet Ray served as word processor operator. Editing was performed by Joan Blank and Elizabeth Martin.

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EXECUTIVE SUMMARY

Vocational Assessment in Educational Settings clarifies issues about vocational assessment so that the potential of vocational assessment for special needs students may be fulfilled. The state of the art review of *Vocational Assessment of Special Students for Vocational Education* will help administrators and practitioners design and implement effective vocational assessment services.

Career assessment, vocational assessment, and vocational evaluation are defined, as are the terms community-based assessment, functional assessment, employability assessment, ecological assessment, and supported employment assessment. This monograph presents vocational assessment considerations based on a comprehensive view of vocational assessment—one that constitutes a holistic approach that considers an individual's total career development . . . to provide objective career information for parents, the student, and others to use in planning appropriate educational experiences to enhance the student's employability. From this viewpoint, vocational assessment comprises curriculum-based vocational assessment, vocational evaluation, and community-based vocational assessment, all three of which may be performed partly in conjunction with one another.

Research summarized focuses on the conceptual framework for vocational assessment and methods and use of vocational assessment.

Several questions appear important in forming a conceptual framework to organize information resulting from the complex process of assessing individuals concerning participation in present and future work situations.

- What information is needed about vocational programs and jobs, about individuals, and about support services and assistance in vocational education and in the workplace?
- How can information about individuals be correlated with other information?
- How can this information be used as a basis for decisions on appropriateness of a program and what curriculum adaptations and support services are needed?

Primary perspectives for considering vocational assessment in vocational education are selection and student development. Selection benefits an organization or employer by selecting candidates with the greatest probable potential for success. The goal is to assess students on variables that distinguish between students with high and low potential for success. Conversely, the student development approach is seen as a guidance process that attempts to enhance career development, maximize student skills, and select programs and services to facilitate this. Primary focus is on helping a student succeed. Goals for the student development approach relate to the vocational education program: assessment during program placement and planning, assessment during participation in the program, and assessment during program exiting.

The Minnesota Theory of Work Adjustment has formed the basic conceptual framework for most vocational assessment procedures. In recent years, however, increased emphasis on support services in vocational education and on the job have suggested adaptations of the work adjustment model to accommodate changes that occur in the individual, support systems, and requirements and reinforcers of the environment.

Vocational education programs have been analyzed using the task analysis and worker trait system of the U.S. Department of Labor. Project VESEP identified 160 prevocational enabling skills important for success in vocational education program and curriculum activities, and the Entry Skills Criteria project (now Access Skills) identified negotiable entry level criteria for programs. Still other work identified basic generalizable skills as common across many areas of vocational education.

Methods of Vocational Assessment

Methods of vocational assessment must be based on outcome goals identified by program developers. Trends in vocational assessment methods for special populations include use of real work or work simulations, commercially developed vocational assessment materials, functional community-based special education, supported employment, and rehabilitation engineering. Increasing sophistication in implementation of observational methods in work and community situations makes such approaches as systematic as formal testing situations.

Criteria for methods also depend on outcome goals desired. Those who use assessment for selection choose methods that are brief and facilitate efficient assessment of large numbers of individuals, identifying students with the highest probability of success and screening out students with potential for failure. Advocates of a student development approach use criteria that result in a profile of strengths and needs in categories useful in developing instructional objectives.

Assessment of vocational choice includes vocational exploration experiences, exploration and decision-making programs, vocational interviews, and vocational temperament and personality tests. Vocational skills and abilities assessment involves experiential assessment in vocational education classes or on the job, rating scales, community-based observations, work simulations and task-oriented work samples, functional skill and knowledge tests, school-based observations, trait-oriented work samples, vocational aptitude tests, and trait assessment.

Further considerations in choosing methods of assessment are assessment of student learning style and potential, use of a learning curve, and assessment of special needs.

Use of Vocational Assessment

The major purpose of vocational assessment is to provide meaningful experiences for students and affect educational plans, program placement, and instruction. Methods for ensuring that the information provided is meaningful and useful for vocational education personnel are described. Key issues follow.

- Use of key individuals (special education teachers, students, parents, vocational education teachers, counselors, and support service personnel) in a team approach is highly recommended. Formal and informal information team conferences should be held during decision making and should be conducted from a goal-oriented, functional, interdisciplinary approach.

- Format for reports and documentation should be of the kind, size, color, and so forth, that make them useful for teachers, parents, and students.

- Advocacy and follow-up are necessary to ensure usefulness of the vocational assessment process.

- Program evaluation and revision are based on feedback obtained through formal surveys and informal discussions with vocational instructors and meetings with staff.

- Formal systems of follow-up and program evaluation should be encouraged.

Research studies on efficacy of vocational assessment services have focused on a vocational evaluation center model. Studies have pointed out problems in delivery of effective vocational evaluation services: concerns about the use of vocational assessment measures that do not incorporate direct instruction as part of the assessment process and inaccurate assessment of severely disabled individuals.

Conclusions from studies of evaluation in school settings include the following:

- Attitude and behavior of students improved.

- Vocational evaluators played a major role in helping handicapped students gain access to vocational programs.

- Lack of coordination between special education and vocational education was problematic.

- Support services in vocational education were critical in facilitating access to and success in vocational education.

- Lack of appropriate curriculum adaptation in vocational education hindered access to vocational programs.

- Vocational evaluation reports seemingly were not used or were little used for planning individualized education plans.

Generally, findings from studies of vocational assessment are as follows:

- Vocational evaluation has improved access of individuals to vocational education and, in combination with other support services, can facilitate effective curriculum adaptation.

- Vocational evaluation has been perceived as useful by rehabilitation counselors and has positively affected student attitudes and behaviors.

- Vocational assessment seems to have had less impact on special education curricula.

- Curriculum-based vocational assessment seems to have potential in helping to bridge the gap between assessment and instruction, particularly in special education.

Methods of organizing the process of vocational assessment depend on the desired goals, approach to assessment, and use of interprogram collaboration. Methods include curriculum-based vocational assessment; assessment through special prevocational or vocational exploration

classes, integrated vocational evaluation centers; vocational screening centers; a comprehensive, multi-level approach; and community-based vocational assessment.

The key criterion for an effective process is advocacy to facilitate implementation of recommendations from the vocational assessment process.

Personnel involved in vocational assessment vary depending upon the method used. Although writers disagree on the necessity for a vocational assessment specialist in the various methods, vocational evaluation centers typically are staffed by persons with specific training in vocational assessment. The team approach is highly supported in literature. Increased attention is needed to training and training materials, certification, and personnel standards. Research into personnel competencies also is needed.

Implications and Recommendations

Recommendations and needs related to research, development, and policy development must be addressed so that the potential is realized for vocational assessment to be an effective part of the service delivery system of vocational education and other vocational services for special students. The recommendations and needs follow.

- Development of a database of requirements among similar programs might result in the necessary consistent system for analyzing vocational education program requirements and adaptations.
- Effective, valid, and reliable performance sample exercises are needed that can be implemented in the context of a vocational education program using existing materials that assess students on relative skills.
- Improvements in information description might be effected through development of a method to synthesize and correlate categories of information to develop a vocational profile consistent with best practices.
- Further research is needed regarding improvement in the vocational assessment and decision-making process to determine which clusters of methods are most useful and in what order and which data can best be integrated into individualized planning processes.
- Best practices that enhance the effective implementation and use of the vocational assessment process must be clearly identified.
- Various organizational models of vocational assessment must be tested and systematically evaluated.
- Interprogram design and use of a vocational assessment process is needed among special education, vocational education, rehabilitation, manpower, and mental health/mental retardation agencies.
- Personnel roles, competencies, and standards must be identified and policies developed that will encourage or mandate appropriate personnel skills in delivery of vocational assessment.

INTRODUCTION

Background

Over the last 20 years, educators and policymakers have developed many initiatives whose goal has been to improve vocational education, training, and employment of persons with special needs—including persons who are disabled, disadvantaged, elderly, of limited English proficiency, incarcerated, and veterans. Schools have provided services for special students through the established system of vocational education in secondary schools and postsecondary vocational-technical schools. As special students have been involved in vocational education classes vocational assessment of the interests, abilities, and special needs of these students has become more important.

The Carl D. Perkins Vocational Education Act of 1984 mandated a number of "assurances" in vocational education to ensure that special students would have access to vocational education and could obtain services that would assist them in being successful in vocational programs. Mandated assurances include access to the full range of vocational education programs; information provided to parents and students no later than the ninth grade regarding opportunities in vocational education; assessment of interests, abilities, and special needs of handicapped and disadvantaged students relative to success in vocational education programs; curriculum adaptation and support services; career development counseling; and services to facilitate transition from school to work or further education. Vocational assessment is a key in the provision of all these services.

However, as vocational assessment has been increasingly implemented in schools and vocational education, practitioners and administrators have been confused about how best to implement vocational assessment. Views of best practices in assessment have been changing, and different approaches to vocational assessment are being developed. The result is that the field presently is flooded with competing commercial vocational assessment materials, approaches, and methods of organizing vocational assessment.

This monograph reviews the state of the art relative to vocational assessment, specifically for vocational education in secondary and postsecondary schools. The relationship to vocational assessment for other purposes also is discussed. It is hoped that this review will assist administrators and practitioners in the design and implementation of effective vocational assessment services.

Definitions and Vocational Assessment

Clear definitions are necessary in discussing and describing vocational assessment and its relationship to other student assessment practices in schools and human service agencies. Unfortunately, however, no consensus is apparent in the literature. This lack has hindered effective communication regarding vocational assessment and development of effective vocational assessment practices in schools. Terms that are especially important include **career assessment, voca-**

tional assessment, and **vocational evaluation.** However, other terms and concepts also are being increasingly used in the literature related to services for persons with special needs—**community-based assessment, functional assessment, employability assessment, ecological assessment,** and **supported employment assessment.**

Career Assessment

Some writers have proposed a comprehensive approach to the assessment of special students throughout their school grades that has been labeled "career assessment." The Division on Career Development of the Council for Exceptional Children defined career assessment as a "developmental process beginning at the elementary school level and continuing through adulthood . . . that includes vocational assessment or vocational evaluation much as career education encompasses vocational education" (Sitlington, Brolin, Clark, and Vacanti 1985, p. 3). Other writers have discussed similar concepts (Peterson 1985b; Browder 1987).

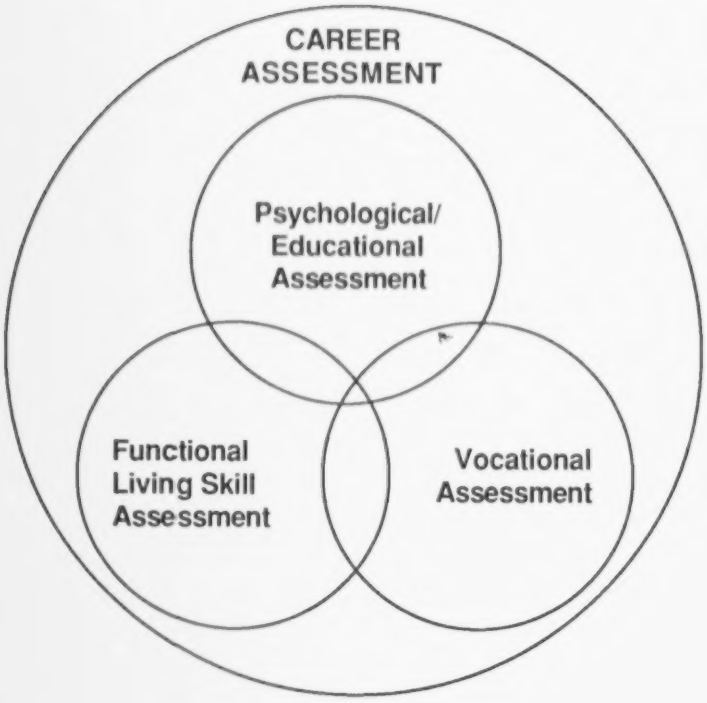
The domains of career assessment, however, are broader than vocations or employment. According to Sitlington et al. (1985), career assessment should be "integrally related to all aspects . . . including not only preparation for employment, but also preparation for the roles of productive family member, citizen, and participant in leisure, recreational, and avocational activities" (p. 3). Browder (1987), Falvey (1986), and others focus primarily on the four major life areas of work, home, community, and leisure. Presently, the concept of career assessment beginning with young children appears to have its primary impetus from those who work with more severely disabled students.

The relationship of career assessment to other assessments for special students is illustrated in figure 1. Career assessment may be thought of as an assessment framework that incorporates educational assessment, vocational assessment, and assessment of functional living skills into a comprehensive process that may be used to develop educational and life plans for work, home, community, and leisure.

Vocational Assessment

Much discussion and disagreement has appeared in the literature related to definitions of vocational assessment and its relationship to other assessment concepts. Different interpretations of the term appear to center on the breadth of vocational assessment. For some, vocational assessment is a very narrow concept that refers to the gathering of information about an individual and, in the view of some writers, is closely associated with testing. The Vocational Evaluation and Work Adjustment Association (1975), for instance, defined vocational assessment as the "determination of the importance, size, or value of the strengths and limitations of an individual which interfere with vocational outcomes" (p. 86). Similarly, Kiernan and Petzy (1982) describe assessment "as a process in which a characteristic factor is appraised in order to assign it a rating, description, or score" (p. 118); Botterbusch (1978b) stated that "vocational assessment is the process of assessing a person to determine the specific nature of his or her aptitudes, skills, characteristics, and work-related behaviors" (p. 2).

Other writers see vocational assessment as an overall process by which vocationally relevant information is obtained and used to develop vocational plans with a student. In this view, vocational assessment is a general term that describes assessment and planning for employment. An often quoted definition of vocational assessment was provided by Dahl, Appleby, and Lipe (1978), that is,—



SOURCE: Peterson (1985b)

Figure 1. Career assessment and its relationship to other assessment for special students

> a comprehensive process conducted over a period of time, involving a multi-disciplinary team approach, with the purpose of identifying individual characteristics, and education, training, and placement needs, which provides educators the basis for planning an individual's program, and which provides the individual with insight into his or her vocational potential. (p. 103)

Peterson and Hill (1982) described vocational assessment in similarly comprehensive, student-centered terms as a—

> developmental learning process by which students can increase their career awareness and explore and understand interactions between themselves and the world of work. Vocational assessment constitutes a holistic approach which considers an individual's total career development . . . to provide objective career information for parents, the student, and others to use in planning appropriate educational experiences to enhance the student's employability. (p. 1)

This more comprehensive view of vocational assessment is used in this monograph.

Other terms describe specific methods of actually implementing vocational assessment. These include **vocational evaluation, curriculum-based vocational assessment, community-based assessment,** and **ecological assessment.** Figure 2 describes the overlapping relationship of three major types of vocational assessment.

Vocational evaluation. Vocational evaluation is a term most often used to describe a time-limited, intensive, comprehensive process of vocational assessment, exploration, decision making, and counseling. Leconte and Roebuck (1987) stated that—

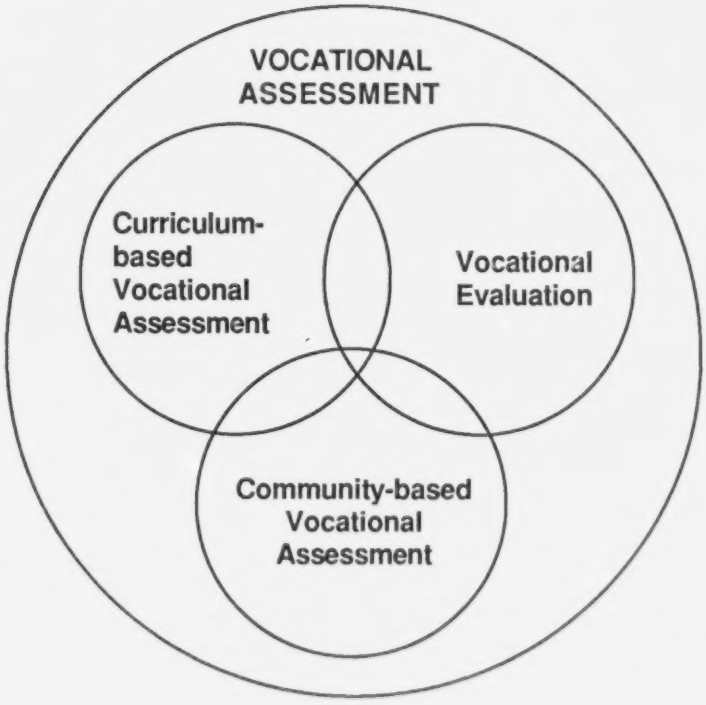
> vocational evaluation may best be defined as a specific process which occurs once or twice (or on rare occasions, more than twice) in a . . . life. It is a comprehensive, in-depth, and intensive process which takes place within a well-defined period of time. It can be identified as having a precise beginning and end in service delivery. (p. 6)

This is illustrated in figure 3.

VEWAA (1975) defined vocational evaluation as a "comprehensive process that systematically uses work, real or simulated, as the focal point for assessment and vocational exploration, the purpose of which is to assist individuals in vocational development" (p. 86). This definition focuses on the use of work, rather than psychological tests or other assessment "systems," as the distinguishing characteristic of vocational evaluation. Despite this definition, vocational evaluation centers have become increasingly associated with use of vocational assessment systems that only minimally use recognizable work, real or simulated, as the key element of assessment.

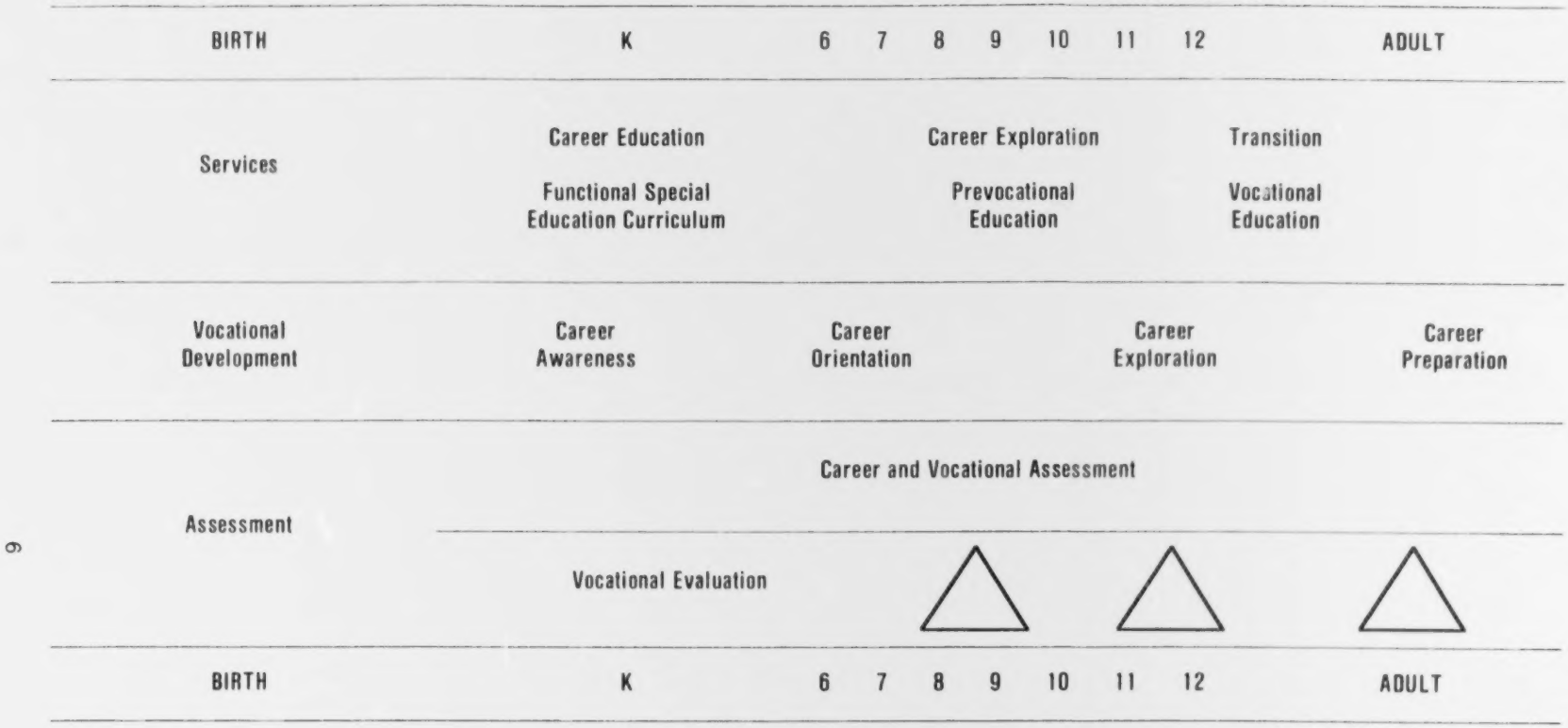
Some individuals do see vocational evaluation and vocational assessment as interchangeable terms (Kiernan and Petzy 1982). However, in this monograph, an increasingly accepted separation of these two terms is maintained.

Curriculum-based vocational assessment (CBVA). Curriculum-based vocational assessment is a recently-developed process for implementing vocational assessment so that it is closely associated with the curriculum of the student. Cobb (1985) defines curriculum-based vocational assessment specifically as it relates to vocational education as "the process of answering service delivery questions about the performance of an individual student through direct measurement of



SOURCE: Adapted from Peterson (1985b)

Figure 2. Relationship of major types of vocational assessment of special students



SOURCE: Adapted, by permission of the author, from P. Leconte, "Methodologies Used in Vocational Assessment and Vocational Evaluation Process," 1987.

Note: Services are depicted on a continuum to illustrate an expected flow and progression and clarify differences in levels and purposes of assessment. Such a rendition is mythical as in reality each individual participates in life processes and requires a dynamic mosaic of services that occur at different times and in different sequences for each individual.

Figure 3. Relationship of vocational assessment, vocational evaluation, and vocational development.

his or her progress against the expectations embedded in a vocational education course of study" (p. 2). Stodden and Ianacone (1986) described CBVA as a process for determining the career development and vocational instructional needs of students based upon their on-going performance within existing course content. Other writers have described instruments and procedures that could provide assessment information as a part of vocational or functional special education instruction (Wentling 1978; Brolin 1986; Browder 1987; Brown 1986; Cameron, Johnson, and Flanagan 1982; Peterson 1986b). Thus, for these writers, the distinguishing characteristic of CBVA is that assessment is conducted as part of instruction to monitor progress of students and guide ongoing planning of student instruction.

Other assessment terms and concepts. A number of terms have been used in the literature that respond to new developments in services. Many of these terms in some way indicate that assessment must be done in the context of the environment in which the individual is expected to function. Related terms include functional assessment, ecological assessment, and community-based assessment. According to Halpern and Fuhrer (1984, p. 3), functional assessment is "the measurement of purposeful behavior in interaction with the environment . . ." where "the results of functional assessment cannot automatically be assumed to generalize across different environments" (p. 4). Similarly, ecological assessment focuses on the interaction of variables in a specific environment with the individual (Brown, Bellamy, and Sontag 1971; Wehman 1981), and community-based assessment involves assessment that occurs within natural environments of work, home, community, and leisure (Leconte and Roebuck 1987). Each of these terms may be considered as a method of conducting vocational assessment so that the dynamic interaction of the individual with the vocational environment is taken into account.

Other terms related to vocational assessment focus on the content and constructs of assessment. Wehman (1981), for instance, discusses "employability assessment," which includes the vocational and independent living capabilities of the individual, parental attitudes, and an environmental or ecological inventory related to specific workplaces.

Finally, assessment processes and terms that describe them have been developed for specific programmatic needs. Thus, Cobb and Danehey (1986) discuss "transitional assessment" whose purpose is to identify needs and services for individuals engaged in the process of transition from school to work. Leconte and Roebuck (1987, p. 25) refers to the work of Gaylord-Ross in which supported employment assessment provides a "comprehensive portrait of a severely disabled individual . . . by collating observations of that person in several settings." Both transitional assessment and supported employment assessment, then, are specific applications of vocational assessment for persons with special needs.

Assessment for Special Education and Vocational Assessment

Federal regulations governing special education require initial and triennial comprehensive evaluation of handicapped students regarding their need for special education services. As yet, there is no specific requirement for vocational assessment in special education law. However, vocational and independent living skills assessment may be implemented as part of this process (Levinson and Capps 1985). To date these two assessment processes are seldom being connected and correlated for planning purposes.

However, some writers and program developers have been developing programs so that vocational assessment is part of the comprehensive evaluation process for handicapped students. Levinson and Capps (1985) describe a regional program in Virginia that provides vocational

assessment services in grades 6-12 and connects these with triennial reevaluations of students. Patten (1981a) similarly described a regional vocational evaluation center in Texas where student reevaluations and vocational evaluations were conducted as part of one comprehensive student assessment process for secondary students.

SERVICE TRENDS AFFECTING VOCATIONAL ASSESSMENT IN EDUCATION

A number of trends in education, rehabilitation, and the employment community are stimulating expanded and improved vocational assessment services for persons with special needs. Vocational assessment of special persons first was initiated as a service in rehabilitation in response to demands on service agencies to expand services for more severely disabled persons. Continued developments in this field of "vocational evaluation" have affected similar services in education. These and other trends are discussed in the following sections.

Vocational Evaluation in Rehabilitation

The first major impetus for improvement in vocational assessment of handicapped persons occurred in vocational rehabilitation agencies. During the 1960s, vocational rehabilitation services expanded to include greater numbers of disabled persons who often had more significant vocational handicaps. More effective evaluation and assessment of persons with disabilities was needed to develop effective rehabilitation plans. Increasingly, rehabilitation facilities began to provide "vocational evaluation" services via vocational evaluation centers housed in those facilities.

Over the years vocational evaluation has become increasingly established as a recognized service in rehabilitation. Nadolsky (1972) developed a model for vocational evaluation services. Based on this model, vocational evaluation would be provided during a time-limited, intensive period ranging from 2 to 4 weeks. During this time, the client would proceed through a sequence of assessment, exploration, and planning activities that would include the gathering and review of background information, client interview, psychological testing, vocational exploration, work samples, situational assessment, job tryouts, and individual counseling. Behavioral observations would be used throughout the process. This process would result in a report and "staffing" in which an individual rehabilitation plan would be developed for an individual.

Vocational evaluation has developed in rehabilitation as a human service specialization. Those involved in this field have stimulated research, materials development, personnel training, and personnel standards to improve the delivery of vocational evaluation services. The Rehabilitation Services Administration has for several years provided preservice and inservice personnel preparation grants to universities related to vocational evaluation and also has funded research and materials development, primarily via the Rehabilitation Institute at the University of Wisconsin-Stout. The Vocational Evaluation and Work Adjustment Association (VEWAA) was organized in 1967 as a division of the National Rehabilitation Association and has stimulated development of vocational evaluation services via its professional activities and journal (Pruitt 1986). Finally, VEWAA was instrumental in initiating the formation of a separate commission whose mission is to set standards for the practice of vocational evaluation and to certify professionals who meet those standards (Certification Commission of Work Adjustment and Vocational Evaluation Specialists 1986).

Vocational assessment of special students in schools and vocational education has relied heavily on the methods and processes of vocational evaluation developed in rehabilitation. Both the needs of the educational system and ongoing changes in services for persons with special

needs is stimulating continued development of vocational evaluation in rehabilitation settings and has demanded additional improvements in vocational assessment for students with special needs.

Transition From School to Work

Transition from school to work has been developed as a major service initiative in recent years to assist persons with special needs to obtain employment. Will (1984) developed a model of transition that has guided policy and services. In this model, students proceed along one of three primary service paths depending upon their needs: (1) no special services, in which students use generic services available to all in the community; (2) time-limited services such as vocational education and rehabilitation, which may provide special assistance for a limited amount of time; and (3) ongoing services in which agencies provide follow-along services for as long as needed. In a study of exemplary transition programs (Ballantyne et al. 1985) vocational assessment was identified as a common element in all programs. At its most effective, vocational assessment facilitates identification of the appropriate service path and selection of community services that will assist the student (Cobb and Dehaney 1986).

Functional, Community-based Special Education

Career development professionals in special education have for many years advocated for special education curriculum content that focuses on work and life skills as well as traditional academic skills (Brolin 1986; Clark and White 1980; Wimmer 1981).

Professionals working with more severely disabled students have developed related recent initiatives. Brown, Bellamy, and Sontag (1971) and others (Falvey 1986) have developed curriculum approaches centered around work, home, community, and leisure, in which instruction is delivered primarily in work, home, and community settings where skills will actually be used. Such functional special education for both mildly and severely disabled students begins at an early age. Thus, assessment of a student's vocational interests, abilities, and special needs may begin early as part of functional and community-based special education curricula. Such curricula will lead directly to more specific vocational training programs at a later age—via vocational education, vocational rehabilitation, supported employment or other options (Wilcox and Bellamy 1987; Wehman, Renzaglia, and Bates 1985).

Browder (1987) has developed an applied behavior approach to a life skills assessment that is intended to provide the assessment base for community-based instruction of persons with severe disabilities. Wilcox and Bellamy (1987) incorporated a systematic assessment procedure into their "activities catalog" curriculum.

Supported Employment

Supported employment is an intensive approach to job placement and vocational training for students who require ongoing support services in employment. More specifically, supported employment most often attempts to provide intensive, one-on-one vocational training on the job with a "job coach" available to individuals who typically have been employed only in sheltered workshops. After the individual begins to perform adequately on the job, the job coach may gradually "fade" from the job site, transferring routine supervision duties to regular supervisors and peers in the work setting. Ongoing follow-along services are provided, however, for periodic retraining, problem solving, and intervention (Mark, Rhodes, and Bellamy 1986).

Vocational assessment has been considered very important in supported employment services. However, widely used vocational assessment systems have often assessed individuals with severe disabilities as having no "potential" for employment prior to their successful employment with the assistance of intensive training and follow-along services. Use of such systems has given rise to severe criticism of the programs that use them. Supported employment programs primarily advocate assessment in actual employment situations (Callahan 1987; Moon, Goodall, Barcus, and Brooke 1986)

Carl D. Perkins Vocational Education Act and Vocational Assessment of Special Students

As special students have increasingly been served in vocational education, numerous services have been developed to provide effective access, support services, and curriculum adaptations to assist special students in being successful in vocational education classes. Vocational assessment has been seen as an essential part of this process. As a result, states have increasingly been using vocational assessment services in vocational education (Peterson 1985a), and study groups of the American Vocational Association (Nelson and Lehrmann 1979) called for expansion of vocational assessment for all students as well as those with special needs. This culminated in the passage of specific provisions in the Carl D. Perkins Vocational Education Act in 1984 that require an assessment of the interest, abilities, and special needs of students with respect to success in a vocational education program.

Title II, Section 204, of the Carl D. Perkins Vocational Education Act requires a number of specific services to assist handicapped and disadvantaged students to successfully complete vocational education programs. Virtually all of the assurances of the Carl Perkins Act for special students are related to or dependent upon effective vocational assessment. Vocational assessment may assist in providing access to the full range of vocational programs if practitioners use vocational assessment as part of a process to help students explore vocational programs and if vocational assessment is used to identify curriculum adaptations and support services.

Vocational assessment may also be used to provide information on vocational education. Vocational assessment and vocational information and exploration are mutually reinforcing services that may be implemented together so that assessment of interests, abilities, and special needs occurs simultaneously.

Curriculum adaptations and support services may be systematically recommended to assist such students in being successful as part of vocational assessment. Identification of such special services relies on some type of assessment process. Further, this does not end as the student enters vocational education but involves continued monitoring of student success in the vocational program.

Career development counseling is both closely associated with and a component of vocational assessment. Students may obtain information about vocational education, have opportunities to explore vocational possibilities, and simultaneously obtain feedback about their abilities and special needs as a part of vocational assessment.

Special students may need assistance in moving into postsecondary education, other alternative vocational training programs such as vocational rehabilitation facilities, or employment. In all of these, information about the student's interests, abilities, and special needs upon completion of vocational education will be very important. Such information is needed to assist in developing a meaningful transition plan.

Although vocational assessment for special students is mandated in the Carl D. Perkins Vocational Education Act, the degree to which vocational assessment has been implemented by states has not been clear. Two national studies have been conducted regarding practices in vocational education. Peterson (1985a) conducted a survey of state departments of vocational education, special education, and rehabilitation to determine the perceived status of vocational assessment in education in each state related to policies, plans to increase vocational assessment, and personnel in vocational assessment. Some 21 states indicated that they had written policies related to vocational assessment, 30 stated the need to "revise or create" policies, and 38 states planned to increase the availability of vocational assessment services. However, this study was conducted prior to the passage of the Carl D. Perkins Vocational Education Act.

Ballard and Leconte (1987) conducted a study of vocational assessment provisions in state vocational education performance reviews of 42 states for 1986. Many states documented significant efforts in developing vocational assessment services. However, a wide range of approaches was apparent. Further, 14 states either reported no specific efforts related to vocational assessment or included very general statements that essentially indicated minimal compliance with the mandates of the Carl D. Perkins Vocational Education Act.

CONCEPTUAL FRAMEWORK FOR DECISION MAKING IN VOCATIONAL ASSESSMENT

Vocational assessment involves a complex process of assessing individuals relative to participation in present and future work situations. Although many commonsense approaches may be effective, the fact is that extremely complicated measurement and decision-making issues are involved. A conceptual framework to organize information is very important. In this context, several questions appear to be important.

- If vocational assessment is intended to help individuals enter vocational programs and, ultimately, to enter employment, what information is needed about vocational programs and jobs?
- What type of related information do we need about individuals?
- What information is needed about support services and assistance in vocational education and in the employment situation?
- How can we correlate information about individuals with information about vocational programs and support services?
- Finally, how do we make decisions based on this information? More specifically, how do we decide if a vocational program is appropriate for a student and what curriculum adaptations and support services are needed?

This section reviews efforts to respond to these questions. First, two very different approaches to vocational assessment are explored that are based upon different conceptual frameworks—selection versus student development. Purposes for vocational assessment are then discussed and related to each of these approaches. An adaptation of the Minnesota Theory of Work Adjustment is then proposed as a conceptual framework for matching individuals, environments, support systems, and services. Subsequently, categories of information about vocational programs, jobs, and persons are discussed.

Approaches to Vocational Assessment: Selection or Student Development

Vocational assessment in vocational education may be considered from two primary perspectives: selection and student development. Dramatic differences are apparent in goals, methods, and processes of organizing vocational assessment from these two perspectives. A confusion of these two approaches is very apparent. Practitioners and administrators must clearly choose between these two basic approaches. Essentially, a selection approach meets the needs of the organization without any particular concern for the individual. For instance, for employers a selection approach to vocational assessment simply screens applicants—often on the most obvious discriminators. Such an approach to vocational assessment does not indicate whether an individual

can actually do a job but screens those who have greater probabilities of doing less well. For vocational education, this approach screens and selects those with the greatest potential for success. Again, such an approach only indicates relative probabilities of success based on various criteria. Some have essentially advocated this approach via the recommendation of testing systems that provide quick screening of many students in a short amount of time.

In a student development approach, on the other hand, vocational assessment is seen as a student development and guidance process that attempts to enhance career development, maximize the skills of the student, and select programs and services that may facilitate this. Although the needs of the organization (employer and vocational program) are recognized, the primary focus is on assisting a specific student in being successful. Thus, related to vocational education, vocational assessment is viewed as part of a comprehensive process of facilitating access to appropriate vocational education programs, monitoring student progress in those programs, and documenting student abilities, special needs, and interests upon the completion of vocational education programs. Both approaches involve the matching of students to the most appropriate programs, but the difference in emphasis is significant. Many writers have advocated such a student-oriented view of vocational assessment (Albright and Cobb 1986; Clark 1979; Cobb 1985; Leconte 1985; Peterson 1986).

Administrators and practitioners must clearly indicate which type of approach is desired and needed in their organization. Vocational educators who desire to use vocational assessment primarily as a method of screening problem students out of programs tend to use a selection approach. However, vocational educators who see vocational education as a career development service will use a student development approach.

Purposes of Vocational Assessment for Vocational Education

Vocational educators must identify what they want from vocational assessment if they are to implement it effectively. Purposes for various approaches to vocational assessment may differ dramatically. However, purposes are not always stated explicitly.

Peterson, McLeod, and Bodenhammer (1981) reviewed goals of vocational assessment and made distinctions between process and outcome goals for students and the professionals and other helpers who work with them. Outcome goals "refer to the output or end product of the vocational assessment process" (Peterson et al. 1981, p. 34)—what is desired as a result of vocational assessment. Process goals describe "results or responses occurring during the process of assessment" (Peterson et al. 1981, p. 33)—how the process of vocational assessment will occur. For professionals, process goals may be to analyze vocational interests and abilities of special students. For students, process goals would focus on exploring vocations and understanding the relationship of their skills and interests to the world of work. Typically, goals for vocational assessment are stated in the literature as process goals—for example, to assess various student characteristics.

Purposes and goals for vocational assessment differ significantly depending upon whether a selection or student development approach to vocational assessment is taken. Typically, outcome goals of the selection approach would be to identify and select those students most likely to succeed in a vocational program, and eliminate students for whom success is less likely. In vocational education and other vocational services such as vocational rehabilitation, selection approaches have focused on identifying those with "potential," that is, defining who is and who is not employable. However, many special students may be successful in vocational education and employment if support services are provided but may not have "potential" without such support services. If

vocational assessment practices do not consider these, then inappropriate screening and limitation of opportunity occurs. This has been a significant issue in assessment for hiring in business and industry as well as selection for receipt of services through vocational education and vocational rehabilitation. In the selection approach, the process goals typically are to assess students on those variables that most efficiently distinguish between those with high and low potential for success. Little to no focus is given to identifying special needs, curriculum adaptations and support services, and other services that may facilitate student success in the program.

A student development approach to vocational assessment of special students has very different goals and purposes. Related specifically to vocational education, Albright and Cobb (1986) discussed goals of assessment: (1) assessment during program placement and planning; (2) assessment during participation in the vocational program; and (3) assessment during vocational program exiting (see table 1). They further identified assessment questions that are important at each stage as an outcome of vocational assessment.

Halpern, Lehmann, Irvin, and Heiry (1982) discussed outcome goals of assessment in the development of a program-related assessment model in which "the outcomes of assessment will have clear implications for subsequent program planning" (p. 6). They identify four stages of decision making in assessment: (1) needs assessment in which eligibility is determined and service priorities are selected; (2) program planning in which individual learning goals, objectives, and services are selected; (3) monitoring of program implementation; and (4) program evaluation to evaluate and revise the individual plan. Phelps and McCarty (1984) applied the student development approach to the overall career development of the individual. Vocational assessment should parallel career education stages of awareness, orientation, exploration, and preparation. Cobb (1985) discussed goals of vocational assessment for vocational education in terms of purposes of assessment in special education. These parallel those goals identified by Halpern et al. (1982) and include screening, placement, program planning, monitoring individual progress, and evaluation.

Peterson (forthcoming) identified related outcome goals for career assessment of special students. These included (1) development of vocational goals, (2) identification of vocational skill development objectives, (3) identification of most effective learning and behavior change strategies to assist students in developing skills, (4) program placement that would describe programs and specific methods by which students would develop skills (e.g., vocational education, career exploration, etc.), (5) adaptations and support services, (6) progress monitoring in the vocational program, (7) improvement of student career decision-making skills, and (8) enhancement of student motivation.

Theory of Environmental Adjustment

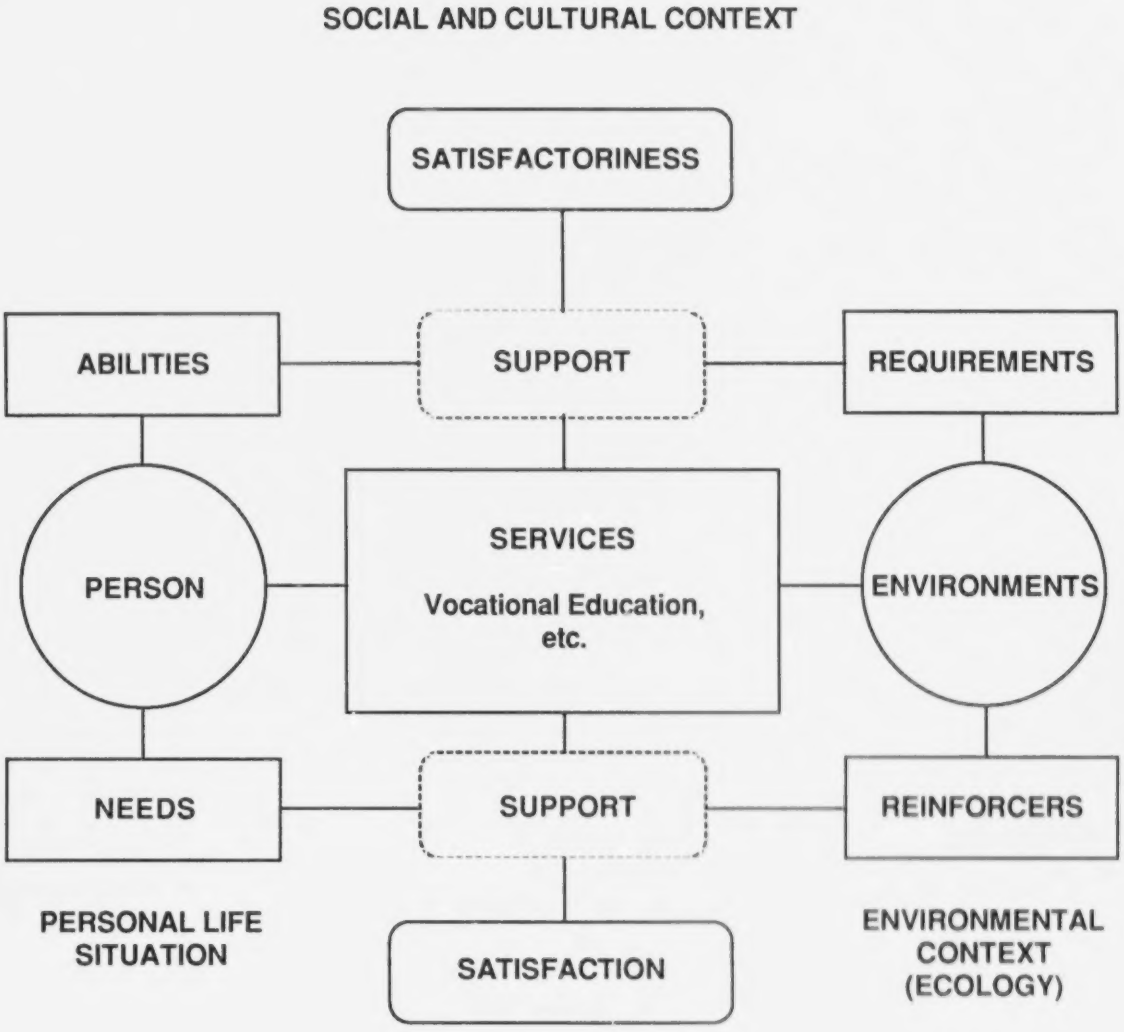
The Minnesota Theory of Work Adjustment has formed the basic conceptual framework for most vocational assessment procedures. Dawis, England, and Lofquist (1964) developed the theory to describe the adjustment of an individual to an environment. According to this model, adjustment occurs when the needs of the individual have been met by the reinforcers of the environment and the requirements of the environment have been met by the skills and abilities of the individual.

Increased emphasis in recent years on support services in vocational education and on the job have suggested adaptations of the work adjustment model. Support systems and services of various types may intervene between the individual and the environment. Additionally, environmental adjustment is not static. That is, changes may occur in all aspects of the adjustment process—the individual, support systems, and requirements and reinforcers of the environment. Peterson (forthcoming) developed an adaptation of this model that includes these considerations. (See figure 4).

TABLE 1
PROGRAM STAGES AND SAMPLE ASSESSMENT QUESTIONS

Stage	Definition	Purpose	Assessment Questions
I. Assessment During Program Placement and Planning	Activities that occur prior to and during first few weeks of student participation in a vocational program.	• Program Selection • Program Placement • Program Planning	• Which vocational program is most appropriate for the student? • What are the special service needs of the student in this particular program? • What will be the criteria used to determine student success?
II. Assessment During Participation in Vocational Education	Activities that take place as the student progresses in a vocational education program.	• Monitor Student Progress • Determine appropriateness of program and service delivery plan. • Evaluate success of student's program	• How is the student performing in the vocational setting? • What changes are needed in student's program?
III. Assessment During Program Exiting	Activities that occur near the end of student's program and following completion.	• Plan for future service needs of student	• What are the special services needed to help the student transition into employment and/or post-secondary education? • Which adult service agencies need to be linked up to the student? • How will student adjustment be monitored?

SOURCE: Reprinted, by permission of the authors, from L. Albright and R. B. Cobb, "Curriculum Based Vocational Assessment: A Concept Whose Time Has Come," forthcoming.



SOURCE: Peterson (forthcoming)

Figure 4. Adapted model of environmental adjustment

The implications of this conceptual model for vocational assessment are many. First, assessment information is needed on all aspects of the model—skills and needs of the individual, support systems, and requirements and reinforcers of the environment (vocational programs and jobs). Second, when discrepancies are apparent between the individual and the environment recommendations must be developed to deal with these discrepencies—through changing the individual, support systems, requirements and reinforcers, or selecting a new environment. This relationship of assessment of individuals, support systems, and vocational programs (environments) to outcomes for vocational assessment is illustrated in figure 5.

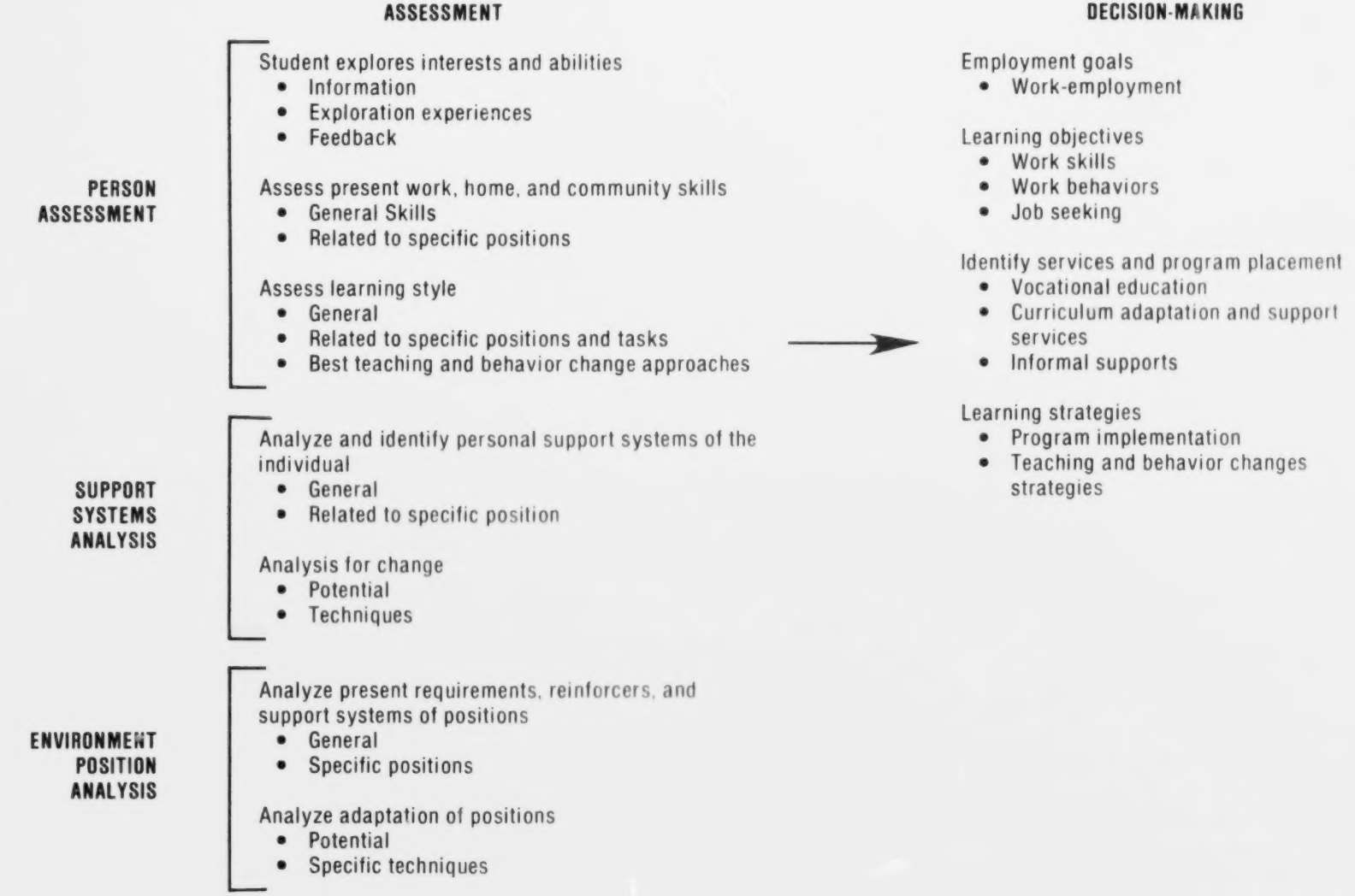
Finally, the environmental adjustment model illustrates the interactive nature of environments and persons. In other words, depending upon the reinforcers and particular style of an environment, an individual may exhibit different needs and skills. The strong implication for vocational assessment is that individuals need to be assessed in the actual environment of interest. Simulation of the many variables that make up the requirements, support systems, and reinforcers in an environment is simply not possible.

Based upon this concept, increasing numbers of individuals have advocated for "community-based vocational assessment," ecological assessment, assessment in integrated and natural settings (Browder 1987; Moon et al. 1986). All these terms are concerned with the same concept—vocational assessment in actual work environments. The implications for vocational assessment in vocational education appear clear and are stated explicitly by many authors in the literature: for valid vocational assessment, students must be involved in the activities and social and physical environment of the vocational education program (Albright and Cobb 1986; Brown 1986; Peterson 1986b).

Categories of Vocational Assessment Information

One of the readily apparent difficulties in vocational assessment is that there is only limited consensus on the categories of vocational assessment information needed. Many approaches to job and vocational program analysis have been used. Likewise, many different methods of categorizing information about individuals have been used. The results are very confusing in that it is difficult to correlate job and vocational program analyses that have been conducted using different formats. Similarly, as different assessment systems use different approaches, synthesizing information about individuals is very difficult. Finally, it is even more difficult to correlate information about individuals to information about jobs and vocational training programs. Although various approaches may be used to correlate information on environments and individuals, most approaches leave out information identified in best practices in the literature. As yet, no overall method of synthesizing best practices has been developed.

Many needs are apparent related to identifying types of information. Information categories are needed that describe the interests, skills, personal support systems, learning style, and special needs of the individual. Likewise, categories of information should describe the skill requirements, reinforcers, and support systems in vocational education programs and the occupations for which they prepare students. Finally, categories related to persons and vocational environments should facilitate systematic comparison of the characteristics of the individual and the environment so that specific strengths and needs may be identified and adaptations and support services recommended. In the next few sections, systems that provide categories of information about jobs, vocational programs, and individuals are reviewed.



SOURCE: Peterson (forthcoming)

Figure 5. Components of assessment and decision-making

Analysis of Vocational Education Programs

A number of projects have designed processes to analyze vocational education programs to determine needed skills, reinforcers, support systems, and possible curriculum adaptations and support services. The task analysis and worker trait system of the U.S. Department of Labor, though designed for use in job analysis, has been used in analyzing vocational education programs (Suda 1985). This procedure involves three basic components for job analysis: listing basic job tasks or duties; identifying hiring and supervision information; and estimating worker traits important in the job—composed of interest, physical skills, aptitudes, general educational skills, and temperaments (U.S. Department of Labor 1972). When used in vocational education programs, the tasks of the curriculum are analyzed and estimates of worker traits are made related to curriculum activities of the program.

This system has been widely used since it provides the largest data base on occupational skill requirements in the country, and most vocational interest and aptitude tests and work samples are tied to it. Analyzing vocational programs in these categories does make systematic comparison of the individual to the program possible when worker trait assessment systems are used (Field and Field 1984).

The worker trait analysis process has been criticized, however, for several reasons. Miller, Treiman, Cain, and Roos (1980) indicated that the worker trait structure does not adequately reflect skills and characteristics important in jobs. For example, skills related to interaction with people are described in very sketchy terms; work behaviors are not described at all. The system does not lend itself easily to considering accommodations or support services on the job or in vocational programs. Finally, the information, in many cases, is too general to be of use in analysis of vocational education programs.

Other projects have developed alternative approaches to the analysis of skills important for success in vocational education. Project VESEP (Reynolds et al. 1976) identified some 160 prevocational enabling skills important for success in vocational education programs and curriculum activities in the state of Michigan. The Entry Skills Criteria project, more recently entitled "Access Skills," identified "negotiable entry level criteria" for vocational education programs in the state of Missouri (Cameron et al. 1982). Greenan (1983) adapted the work of Smith in Canada in identifying basic "generalizable skills," which were identified as common across many areas of vocational education. All of these projects have been used as a basis for comparing assessment information on students with program requirements.

Other projects have described additional methods or approaches to analyzing vocational programs. Peterson (1986b)described a process of analyzing programs to develop behaviorally anchored rating scales of important "competencies" using an adaptation of a process used with assessment centers in business and industry (Thornton and Byham 1982). Peterson, Leconte, and Neubert (1987) developed a format for "vocational training analysis" that included an analysis of occupational goals of the programs; cognitive, behavioral, physical, educational, and specific vocational skills needed for entry into the program and potential adaptations of these; teaching style and approach of the instructor; and adaptations and support services needed and available.

Although these projects are useful, additional work is needed to develop a database of vocational program requirements based on averages that can also be updated based on local requirements and teacher style. Additionally, a format is needed that is based upon best practices and encourages and facilitates adaptation of the curriculum based on individual student needs and characteristics.

Individual Vocational Profile

Although vocational program analysis identifies information related to success in the vocational program, individual vocational profiles relate to categories of information that describe individuals. A number of writers have described vocational profiles for individuals. Project VESEP (Reynolds et al. 1976), The Entry Skills Criterion Project (Cameron et al. 1982), and the Generalizable Skills Project (Greenan 1983) have all been used as a basis for a vocational assessment profile for individuals. Specifically, the categories of information that were identified as important for success in vocational education were developed into rating scales that could be used to record information about the individual. Student characteristics and program requirements then may be systematically compared.

Other projects have developed an overall life skills profile of which vocational skills are one part. Brolin (1986) developed a profile of skills needed to function in every day life that consisted of 22 competencies and 105 subcompetencies that were organized into three broad areas: personal-social, daily living skills, and occupational guidance and preparation. Halpern et al. (1982) identified categories of assessment information divided into four broad groups: foundations of achievement, foundations of adjustment, community adjustment skills, and prevocational and vocational skills.

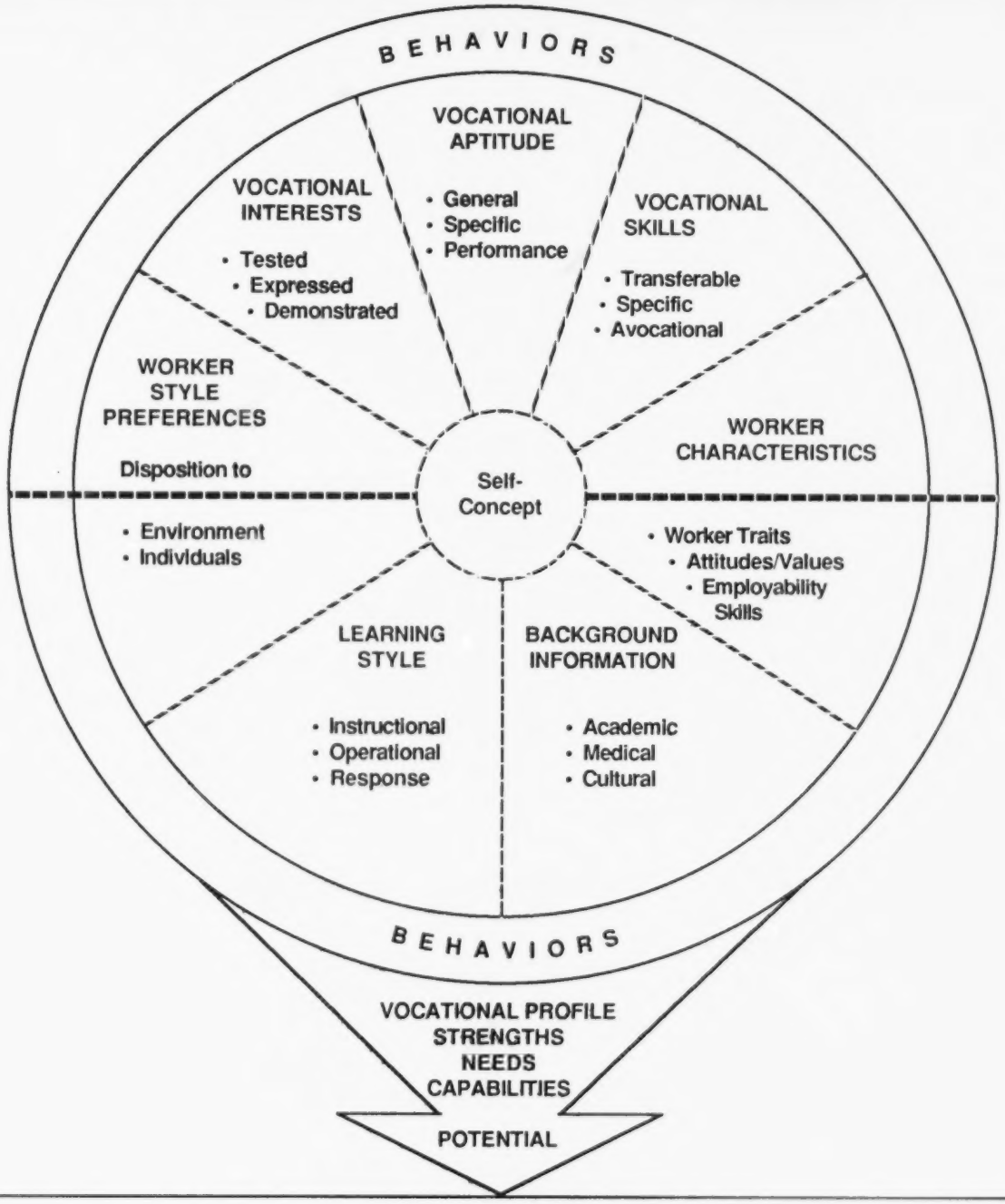
Other vocational profile systems for individuals have been developed. The worker trait profile of the U.S. Department of Labor (1977) was discussed above and has been used widely with assessment of individuals. Selz, Jones, and Ashley (1980) identified "functional competencies for adapting to the world of work," which included skills in two major categories: occupational adaptability and consumer economics. Similarly, Leconte and Roebuck (1987) developed an approach to integrative assessment of the total individual which includes self concept as a central focus, various vocational attributes, and systematic observation of behaviors. (See figure 6.)

Other vocational profiles center around task assessment of the individual. In other words, an individual's skills are assessed relative to the specific vocational tasks in vocational programs that they can perform. In these approaches, jobs or vocational programs are analyzed and tasks identified. Information is then obtained regarding how well the student can presently perform each task. Such approaches have been increasingly used in supported employment and community-based special education (Browder 1987; Callahan 1987).

Peterson (forthcoming) developed an individual vocational profile that attempted to organize categories of information about programs, jobs, and individuals. This profile is summarized in the appendix and includes the following major categories: vocational choice, personal living and support system, vocational support system, basic skills, and specific work skills. Work skills include obtaining and entering employment; work experiences; dimensions; tools, equipment, and technical skills; work habits and behaviors; vocational task performances; and adaptations and accommodations to jobs or vocational education programs.

Constructs of Vocational Profiles

Individual vocational profiles are based upon a listing and description of skills and characteristics of the individual. These may include skills described in several different ways: broad traits as with the DOL worker trait system; specific, detailed traits as with the VESEP project; and more functional skills as with Brolin (1986) and Selz et al. (1980). The scope of skills statements is one important issue. Broad skills statements will be fewer in number and, therefore, more manageable; however, more detailed statements provide more specific information.



SOURCE: Reprinted, by permission of the authors, from P. Leconte and E. Roebuck, "Methodologies Used in Vocational Assessment and Vocational Evaluation Process," 1987.

Figure 6. Integrative assessment of the total individual

Additionally, the construct of an information category is another important issue. These appear to include five broad categories: traits, tasks, skills, behaviors, and behavioral dimensions. Traits are abstract, underlying characteristics assumed to exist in an individual and are generally assessed via tests that provide "indicators" of a trait. Thus, vocational aptitudes and intelligence are traits. In vocational assessment, traits appear most useful in a selection approach but have limited uses in a student development approach.

Skills are abilities to perform meaningful operations in the performance of a job. However, they may not be considered specific to any one situation. For instance, a student may have the skill to balance a checkbook. However, this is considered a task at the point at which this skill is considered part of the duties of a job or performance at his home.

Tasks are specific, meaningful components of actual work activities. For instance, changing a spark plug is one task involved in small engine repair. Tasks are generally assessed via observations of the individual and are based upon task analysis.

Behaviors are all observable performances or responses of the individual. Tasks are a type of behavior. However, other behaviors are important on the job, including interactions with peers and supervisors.

Behavioral dimensions may be thought of as midway between traits and task performance. Behavioral dimensions were developed in assessment centers in business and industry and are clusters of observable behaviors. For instance, a manager engages in many specific behaviors that relate to planning. These may be clustered into a dimension by that title. Dimensions are constructs that allow a behavioral approach to complex skills and sets of behaviors for vocational assessment purposes.

METHODS OF VOCATIONAL ASSESSMENT

Methods of vocational assessment must be selected on two levels: (1) program development and (2) selection for individual students (Botterbusch 1982b; Peterson and Hill 1982). Considerable confusion and controversy exist in the field concerning which methods and techniques of vocational assessment are the most useful. However, methods of assessment can only be selected effectively when vocational programs and job opportunities have been identified locally, information is available concerning requirements and potential adaptations, and information about the needs of the student population are determined (National Association of Vocational Assessment in Education-NAVAE 1986). Methods must be selected that will lead to the outcome goals identified by those developing the program.

Several trends related to vocational assessment methods for special populations have evolved over the last 20 years. As vocational evaluation developed in rehabilitation programs in the 1960s and 1970s, methods of vocational assessment included use of real work (situational assessment, workshop job tryouts, on-the-job tryouts), or work simulations (such as work/performance samples) that had relatively high face validity. Vocational evaluation was defined as using "work—real or simulated—as the focal point of assessment and exploration" (Vocational Evaluation and Work Adjustment Association 1975). The initial commercial work sample systems (TOWER, Singer) involved recognizable tasks of jobs (Botterbusch 1982a). However, as the field developed, increasing numbers of "work sample systems" (such as VALPAR, HESIER, SAGE, and others) were developed that attempted to measure isolated traits on abstract tasks that had limited apparent connection with real work tasks. Vocational evaluation centers in rehabilitation and schools became increasingly dependent upon the administration of such instruments and decreased the use of real work tasks as measurements. As schools have developed vocational assessment programs, many writers have criticized this approach as having limited use in providing meaningful vocational assessment via a student development approach (Cobb 1985; Peterson 1986b). Many writers are developing approaches that return to the use of real work situations and other community-based situations as the basis of vocational assessment (Callahan 1987; Cobb 1985; Halpern et al. 1982; Leconte 1985; Moon et al. 1986; Peterson 1986a). Some commercial companies are developing vocational assessment materials that respond to these needs. Developments in functional community-based special education, supported employment, rehabilitation engineering, and other areas have all suggested the use of actual work tasks as the basis of vocational assessment. Some individuals have referred to this approach as "informal" vocational assessment as a means of distinguishing it from more formal test administration procedures (Cobb 1985; Tindall and Gugerty 1980; Lehmann and McAlonan 1985). However, increasing sophistication in the implementation of such observational methods in work and community situations is evident so that such approaches may be just as systematic as formal testing situations.

Criteria for Vocational Assessment Methods

A number of writers have attempted to articulate criteria for effective vocational assessment methods. Criteria depend upon the approach to vocational assessment selected and the outcome goals desired as discussed above. Those who intend to use vocational assessment primarily as a

screening and selection device appear to choose methods that are brief and facilitate efficient assessment of large numbers of individuals, identify students who have the highest probability of success in the vocational program, and screen out students who appear to have potential for failure. Relatedly, most programs whose purpose is to screen students use norm-based rather than criterion-based assessment to screen those with greater probabilities of success. Such criteria are most evident in the advertising literature of companies that market vocational assessment screening systems.

Those who advocate a student development approach to vocational assessment use other criteria to select vocational assessment methods. Vocational assessment should be relevant to local jobs and vocational education programs (Albright 1982; Botterbusch 1982b) and directly relate to jobs and vocational programs. In other words, vocational assessment should yield information that can be directly related to instruction and services for the student (Halpern et al. 1982).

Methods should also provide an assessment of vocational competencies and report assessment results so that a clear indication of vocational strengths and needs is provided (Peterson 1986c). In other words, vocational assessment should result in a profile of strengths and needs in categories that will be directly useful in developing instructional objectives. This is often done via task analysis and skill profiles. Overall, total scores on tests or instruments are not seen as useful for developing instructional programs (Halpern et al. 1982).

Increasingly, criterion-referenced assessment of critical skills, interests, and behaviors needed for employment and vocational education programs are being used (Cameron, Johnson, and Flanagan 1982; Dunn, Korn, and Andrew 1976; Halpern et al. 1982; Peterson 1986a, 1986b). Normative results may be useful in providing a view of the characteristics of the individual relative to others, but only criterion-referenced approaches can indicate the actual employability of the individual. Dunn, Korn, and Andrew (1976), for instance, indicated that when using industrial norms for work samples, even a score at the first percentile places an individual above some successfully employed workers.

Increasingly, those involved in vocational assessment of special students advocate use of natural, real-world work and community situations as the primary tool of assessment (Botterbusch 1978; Browder 1987; Callahan 1987; Vocational Evaluation and Work Adjustment Association 1975). This brings vocational assessment back to using approaches advocated in vocational evaluation in rehabilitation early in its development. Such approaches are critical for individuals who are severely disabled and have difficulty generalizing from one setting to another (Browder 1987; Moon et al. 1986). For students in vocational education, this allows both student and instructor to obtain better information regarding the student's participation in vocational education (Cobb 1985).

Methods should also involve students in a process of exploration and decision making (Leconte and Rothenbaucher 1987). Vocational assessment is a student-centered process, providing assessment of potential for and recommendations for change in the individual (learning assessment), jobs or vocational programs (adaptation), or support services. Relatedly, assessment of the special needs of students should be provided. Vocational assessment methods should be technically adequate with meaningful validity and reliability and cost efficient for each method as well as the totality of methods that make up the vocational assessment process.

Given fiscal constraints, the question of cost effectiveness is a critical one. Those who advocate a selection and screening approach to vocational assessment have stressed the ability to test large numbers of individuals in a short amount of time (Botterbusch 1983). The need to provide

vocational assessment of large numbers of handicapped and disadvantaged students in the public schools has caused concern. Certainly, resources are not available to provide a comprehensive vocational evaluation of all students. Those advocating curriculum-based vocational assessment and multilevel models, however, state that vocational assessment should be conducted as an integral and needed part of the curriculum using existing resources and low cost assessment instruments that should yield higher quality outcomes (Albright 1982; Albright and Cobb 1986; Peterson 1986b). Further, utilization of actual school, work, and community environments for assessment requires systematic observation and recording systems that are also relatively low in cost. However, the very nature of curriculum-based and multilevel approaches to organizing vocational assessment necessarily demands change in the instructional delivery system.

Various methods of vocational assessment of the individual are further discussed and are based on several major categories related to vocational education: vocational choice, vocational skills and abilities, learning assessment, and special needs of students. Many, if not most, of these methods may be used before, during, and upon completion of vocational education. An attempt is made below to describe methods beginning with those that most meet the criteria described above.

Assessment of Vocational Choice

As described in the vocational profile in the appendix, vocational choice is a much more inclusive and potentially useful term than vocational interests. Vocational choice refers to all those variables that affect and are associated with vocational interest including the following: vocational awareness; vocational role models; interests and goals of parents and significant others; stated, observed, and tested interests. All of these factors must be considered together since individuals' interests can only be defined by their experiences and awareness. Related to program development, therefore, vocational exploration and vocational choice assessment should be closely connected.

Vocational Exploration Experiences

Stated and observed vocational interests and choices may be assessed effectively and efficiently via involvement in vocational exploration experiences. Assessment may be documented via narrative observations, interviews associated with the experience, or use of simple vocational interest checklist or response forms. For instance, a student may use a simple checklist to indicate programs to explore further following a tour of vocational programs.

Many forms of vocational exploration experiences related to vocational education programs may be used. **Exploration of jobs related to vocational programs** may be helpful via job shadowing, experienced-based career education, job simulations, or work samples with high face validity. **Exploration of vocational education programs** directly have been used by a number of school districts. Specific techniques could include tours of vocational programs, prevocational exploration sequences, vocational classroom tryout and observation, and performance samples in vocational classrooms. Parental observation of **home-based experiences** such as preferred home activities and chores may be helpful as may be observations of special education teachers and others related to **school-based experiences.** Checklists, written exploration instruments, short narrative reports, and informal interviews may provide methods of documenting interest assessment information based on these techniques. Note that, in experience-based techniques, vocational exploration and assessment of interests and skills may occur simultaneously.

Vocational Exploration and Decision-Making Programs

Many packages and materials have been published that are intended to facilitate career exploration and decision making. These need to be carefully selected for students with special needs since many require advanced reading and cognitive levels. Some materials are specifically designed for use with special populations, and publications are available that provide information about them (Indiana Career Resource Center 1979; Kapes and Mastie 1986). These materials may be classified into the following categories: (1) **paper and pencil workbooks or inventories** that lead students through a systematic consideration of interests, skills, and choices in the world of work (e.g., the Self-Directed Search and Career Decision-Making); (2) **microcomputer exploration and decision-making programs.** Many of these programs are on the market that lead a student through a decision-making process. However, many require the student to rely totally on verbal skills (e.g., Discover, CHOICES). Some programs are available that include students in career exploration activities via computer graphics. The Career Planning system (Conover 1987), for example, was developed by the National Center for Research in Vocational Education for use with special needs students. A wide variety of audiovisual and printed materials are also available that provide vocational information about the tasks, duties, and salaries of occupations. This information is reviewed in several publications. Again, some materials were designed specifically for use with special needs students. The degree to which such materials relate specifically to vocational education also varies greatly.

Vocational Interviews

Stated interests of individuals may be obtained via informal and formal interviews. Interviews may be used with other techniques. Czerlinsky, Strohmer, Menz, Coker, and Engelkes (1986) have developed and field tested a semi-structured interview format related to career decision making. Many writers in the literature recommend formats for conducting and recording vocational interviews that include items related to vocational choice. (Leconte 1985; Peterson and Hill 1982; Posey 1982).

Vocational interest inventories and tests may also be used alone or as part of a vocational assessment, exploration, and decision-making process. Vocational interest inventories include four basic formats: written, picture, audiovisual, and computer-based. Low reading level forms are available with some written tests (e.g., COPS). Picture interest inventories are especially helpful with students who have low reading levels. Several publications provide a review of these tests (Kapes and Mastie 1986; Peterson 1985). Additionally, some persons have developed interest inventories based on vocational education programs and jobs available locally.

Vocational Temperament and Personality Tests

Another aspect of vocational interests has been described as vocational personality or temperament. Many tests have been developed to assess personality styles. Some have interpretation procedures that relate directly to vocations, such as the Vocational Implications of Personality published by Talent Assessment Programs of Jacksonville, Florida, 1986, whereas others are more general personality tests that must be interpreted vocationally by the user. Examples of such tests are reviewed in Botterbusch (1976).

All of these techniques have been used separately or together. Evidence seems to indicate that all may be useful. However, special needs students often learn intuitively and experientially so that the use of experiential techniques supported by other methods appears most effective (Nadolsky 1981).

Assessment of Vocational Skills and Abilities

Approaches to assessment of vocational skills and abilities are numerous and vary along several dimensions: (1) degree of involvement in actual work experiences, (2) type of construct assessed, (3) method of relating results to recommendations for vocational programs, and (4) degree to which results are useful for planning vocational instruction. Skill assessment techniques are varied and are reviewed below.

Experiential Assessment in Vocational Education Classes or on the Job

Involvement of students in the actual vocational education classroom as part of vocational assessment provides opportunities for simultaneous skill assessment and vocational exploration. This involves the vocational teacher and paves the way for appropriate adaptations and support services in the vocational program. This method has been highly recommended in the literature (Albright and Cobb 1986; Brown 1986; Leconte 1985; Neubert 1986).

Several methods of conducting this process have been identified. **Performance samples** involve the student in tasks typical in the vocational curriculum and may be administered by vocational teachers or other individuals. In some cases students may be paired with other students already in the class. Such performance samples are a type of "work sample" and may be very formally developed with a manual and rating forms or may be very informal. Albright (1982) and Peterson (1986a) have described procedures for developing performance/work samples designed around local vocational programs. Work samples for occupations related to vocational programs may be modified for use in vocational classrooms. A catalog of manuals for work samples is available (Fry 1986). Commercial work samples related directly to vocational education programs may be located and administered in the vocational classroom as well. Finally, a student may simply **participate in the ongoing structure of the class** for one or more periods. Assessment of students using such techniques is best conducted using rating scales, checklists, or other scoring mechanisms based upon an analysis of skills important in the vocational program as discussed above.

If a student is considering a vocational program that uses on-the-job training (such as cooperative vocational education or supported employment), on-the-job evaluation may be most appropriate. This may be conducted in **job tryouts in sheltered workshops** or on actual **community jobs** as part of the assessment process. Botterbusch (1978a) and others (Moon et al. 1986) described procedures for on-the-job evaluation. Typically, such methods involve less systematic administration and rating than work samples. However, as with performance samples in vocational classrooms, systematic procedures can be developed for administration of work tasks in real work settings. A real work setting would be used rather than a simulated setting.

Less structured and intensive methods of involvement in the vocational classroom may include interviews with the vocational education teacher and observation of the vocational class. Although students are involved in the vocational class with the latter methods, only minimal opportunity is provided for useful skill assessment.

Rating Scales

Rating scales are often listed as a vocational assessment technique. However, they do not so much constitute a separate technique as they provide a format for recording observations of various sorts—whether through vocational classroom tryouts, on-the-job evaluation, or community-based observations. A multitude of rating scales exist. Some of these are based on an analysis of

vocational education programs, some on an analysis of jobs, and others based upon worker characteristics that are often problematic for special students (Harrison, Garnett, and Watson 1981). For example, rating scales have been used to estimate the worker traits of an individual as defined by the U.S. Department of Labor by parents, teachers, and students (Robinson 1986); and a number of rating scales are based on work behaviors and social skills important on the job (Bitter and Bolanovich 1970; Walls, Zane, and Werner 1978).

Community-based Observations

Students are involved daily in home and community situations where they demonstrate vocationally relevant behaviors and skills. Obtaining feedback on a student's performance in those situations may be very useful. One feasible method of obtaining such information has been via the use of checklists and rating scales by parents, significant others, and by students themselves. Rating scales based on skills needed in vocational programs may again be used as described above. Halpern and others (1982) and Botterbusch (1978a) reported instruments that could be used with community-based observations.

Work Simulations and Task-oriented Work Samples

Work simulations and work samples describe very similar techniques. Both involve systematic observation of an individual's performance on a sample of tasks that simulate actual jobs in the community and involve the tasks (thus, the term "task-oriented work samples"), materials, and tools of jobs or, for vocational programs, activities in the vocational curriculum. These methods look like real work activities and may be identical to performance samples. Work samples are often associated with specially packaged commercial instruments that are often set up in special booths. One criticism of such packages is that they may not effectively simulate the actual vocational classroom or working conditions.

In a generic sense, however, work samples are simply a sample of work. They may be designed to be administered in actual work environments, vocational classrooms, or in home and community situations. Such methods, however, are characterized by the use of systematic and consistent rating and scoring techniques. The Materials Development Center (Fry 1986) has developed materials that describe development of local work samples. Peterson (1986a) provided a description of several formats of work samples and proposed a model adapted from business and industry that used several short "assessment exercises" to assess identified vocational competencies.

A number of individuals advocate development of local work or performance samples based on local employment and vocational programs. In both cases, development of local work samples involves several steps: (1) analysis of the job vocational program to determine important tasks, skills, and competencies for success; (2) development of one or more tasks that the individual can perform to demonstrate skills. For vocational education programs, a performance/work sample might include brief instruction in one of the early, simple activities of the curriculum and then performance of this activity. This would assist the instructor in understanding the present skill level of the student and how the student learns. (3) Thirdly, a method of scoring or rating the performance on the work sample would be developed. (4) Finally, a manual would be developed that describes how to administer and score or rate performance on the work sample (Albright 1982; Peterson 1986c; McCray 1980; Sitlington 1979).

A number of resources are available that provide manuals of work samples that have been developed by local programs. A catalog of work sample manuals is available from the Materials Development Center at the University of Wisconsin-Stout (Fry 1986). These may be borrowed and copied for a small fee. Although most were developed by rehabilitation facilities based upon local jobs, they can be adapted for use in relevant vocational education programs. Cameron, Johnson, and Flanagan (1982) developed a series of performance/work samples for a number of specific vocational education programs. Thomas (1984) also developed a series of performance samples for vocational programs he called the Vocational Education Readiness Test (VERT).

Work samples, performance samples, or work simulations may be developed locally, adapted, or purchased commercially. Several commercial systems are available that involve students in work tasks with high face validity. For example, these include: COATS; CHOICE; MECA (Microcomputer Exploration of Career Areas); and Singer/New Concepts (Botterbusch 1982a).

Functional Skill and Knowledge Tests

A number of paper and pencil tests are being developed that focus on assessment of knowledge and skills in functional areas related to life skills and, to a lesser degree, vocational skills. For example, the Social and Prevocational Information Battery (SPIB) was designed for mentally retarded individuals. Other materials provide assessment, exploration, and instruction related to functional academics in the vocational classroom. *Math on the Job* (Conover 1987) is one example. Hartley, Otazo, and Cline (1979) developed materials designed to provide a preassessment of student academic skills related to the vocational education program. Such materials may be useful in determining actual functional skills related to the vocational program.

School-based Observations

Observations of student social, academic, behavioral, physical, and related skills can be provided by teachers, school psychologists, counselors, and other professionals. Often these are already a part of the school records for a student. Additionally, however, such individuals may use rating scales and checklists of skills that are described in vocationally relevant terms. Such concepts of team input have been especially stressed in the literature on curriculum-based vocational assessment (Cobb 1985; Francis 1980; Patten 1981a,b; Peterson 1986b; and Stodden and Ianacone 1986).

Trait-oriented Work Samples

Although task-oriented work samples focus on the assessment of an individual's ability to do or learn actual work tasks, trait-oriented work samples, like vocational aptitude tests, typically use hands-on, applied activities to assess underlying worker traits or general skills of an individual. Typically, these traits are assessed using the trait structure of the Department of Labor and are matched to occupations via printed materials (Field and Field 1984; McCroskey and Perkins 1981) or computer-based job matching programs (Botterbusch 1986). Most commercial vocational evaluation systems, particularly those developed in recent years, are based on this approach. In some cases (JEVS, for instance), multiple work samples are used to obtain multiple assessment of each worker trait. These are often referred to as cluster trait work samples. Single trait work samples, such as VALPAR and SAGE, have developed tools that attempt to assess one specific trait. For example, the eye-hand-foot coordination work sample attempts to measure this physical skill. Such trait work samples may use tasks that look like real work tasks to measure traits. However, many (APTICOM, SAGE, SAM, VALPAR, etc.) use relatively abstract tasks that have limited face validity (Botterbusch 1982a).

Vocational Aptitude Tests

Vocational aptitude tests, like trait-oriented work samples, attempt to assess underlying worker traits of an individual. Vocational aptitudes include basic cognitive, perceptual, and psychomotor traits that increase the ease with which students may learn vocational tasks. Vocational aptitudes are one category of worker traits and a similar process of matching aptitudes to jobs is used as with trait-oriented work samples described above.

Vocational aptitude tests are usually paper and pencil tests involving abstract tasks related to cognitive, perceptual, spatial, and psychomotor skills. Aptitude tests may include multiple aptitude tests (the General Aptitude Test Battery, Armed Services Vocational Aptitude Test Battery) and single aptitude tests. Dexterity tests are a specific type of aptitude test. Aptitude tests are reviewed in several publications (Botterbusch 1978b).

Trait Assessment: An Evaluation

Trait assessment measures are perhaps the most used in vocational assessment. However, by their very nature they are most effective with a selection approach to vocational assessment. That is, by design they are intended to screen/identify individuals who exhibit the greatest likelihood of success based upon assessment of very general abilities.

Aptitudes are the most used type of worker trait in skills assessment. Aptitude assessment cannot with any degree of certainty identify whether or not an individual can presently do or learn to do a task except in the most general sense. Halpern et al. (1982, p. 5) stated that "the traditional argument would state that the trait of 'manual dexterity' should predict how well and how quickly a person should learn to change a tire. Our experience with retarded persons does not support the traditional argument." As another example, if an individual's tested cognitive aptitudes are very low, we would estimate that he or she will probably not function effectively as a brain surgeon, which requires high cognitive skills. However, we are less certain about their ability, with special and intensive training, to learn to operate a cash register that requires average cognitive abilities when only short-term training is provided.

Aptitude tests can only indicate general probability that an individual may learn easily. For instance, in the General Aptitude Test Battery, cutting scores were identified for occupations. However, some 50 percent of an occupational group who were performing adequately on the job actually scored lower than the cutting score (U.S. Department of Labor 1972).

The degree to which broad traits include the most important skills related to many occupations has also been highly questioned by many individuals (Miller et al. 1980). The development and use of occupational "dimensions" by assessment centers in business and industry has been based upon a need to more clearly identify job-related constructs for assessment (Thornton and Byham 1982). Cobb (1985) has questioned the degree to which these tests relate to vocational education programs. Assessment of worker traits alone further provides information that is not especially useful in vocational instruction, is difficult to use in suggesting job or vocational curriculum adaptations, and provides questionable identification of overall vocational recommendations.

Not only are worker traits questionable assessment constructs, but the manner in which work sample systems assess these traits and connect scores with worker trait levels may be questionable. Only a few companies indicate the methods by which they make the connection between test scores and worker traits (Botterbusch 1982a). In one informal study, for instance, recommendations for jobs were found to be different with manual- and computer-scored versions of a testing

system (Johnson 1985). Another study (Clark 1985) found that the data-people-things levels reported by VALPAR for their work samples were significantly higher than levels determined by job analysis.

Given these difficulties, trait assessment using aptitude tests and trait-oriented work samples appear valuable only as very rough screening techniques. Some practitioners have found these valuable in generating a list of occupational options that might not have been considered for an individual—in other words, opportunity expanding. However, screening individuals with special needs out of opportunities based on these results does not appear at all warranted.

Further, some writers have suggested that worker trait assessment may be more validly obtained in the context of using real work experiences and task-oriented work samples and job simulations (Moon et al. 1986; Robinson 1986). This procedure has been called "direct evaluation" in which assessment situations (community jobs, performance samples) are analyzed to determine maximum levels of worker traits that can be assessed via a particular task. Rating of worker performance on that task then provides estimates of worker traits. Robinson (1986) developed a procedure in which teachers would estimate worker traits of an individual based upon classroom observation and instruction. No studies have been implemented using this procedure. However, since worker traits involve skills with which teachers are familiar (general education, general intelligence, verbal skills, dexterity), it seems reasonable that this method could provide a reliable and equally valid method of assessing worker traits with minimum expense.

Assessment of Learning Style and Potential

Assessment of an individual related to learning vocational tasks is central to providing effective vocational instruction for special needs students. Learning assessment, however, appears to receive less emphasis than interest and skills assessment. Learning assessment is actually composed of several related components. These include the potential of an individual to learn vocational tasks of various types at varying levels of difficulty, the rate of learning of the individual under various types of conditions, and learning style—variables that assist the student in learning including instructional and behavioral change approaches. Various approaches have been used to assess each of these major areas and are discussed below.

Numerous attempts have been made to assess the potential of an individual to learn various vocational tasks. Intelligence tests have attempted to measure learning potential based on assessment of present abilities. The assumption is that all individuals have had equal opportunities to learn basic skills. If they have not learned these, then their innate learning ability is low. Further, intelligence is seen as a stable trait that is not especially amenable to change. Professionals have been increasingly critical of intelligence assessment. As a particular type of aptitude test, information is not helpful in developing educational programming and can actually be harmful by inappropriately lowering learning expectations (Feuerstein 1979).

Feuerstein developed a concept of "plastic intelligence" in which he posited that individuals can improve their reasoning abilities. If we are attempting to assess learning potential, the most effective method of doing this is to actively involve the student in a learning process and systematically observe how the student learns. Towards this end, Feuerstein (1979) developed a Learning Potential Assessment Device (LPAD) based on these principles.

This same concept has been adopted by some conducting vocational assessment with severely retarded individuals and has been used both to identify potential of the individual to learn tasks and to suggest best instructional or behavior change strategies. The Trainee Performance

Sample (Irvin, Gersten, Taylor, Close, and Bellamy 1981) uses a variety of work tasks at varying levels of difficulty presented using three different instruction modes: verbal, demonstration, and physical assistance. Schalock and Karan (1979) described a process of "edumetric assessment" that used criterion-referenced assessment of an individual's learning of tasks in the actual work or community situation. They stressed use of assessment for prescriptive teaching and remediation rather than prediction. Similar approaches have been used in precision-teaching and in task analysis/training approaches used with severely disabled individuals in community settings (Browder 1987).

McCray (1982) described use of this approach with work samples in vocational evaluation and suggested use of active teaching as the first phase followed by a "performance" phase. Peterson (1986b) described variations of this process that could be useful with work or performance samples. The ideas appear useful in direct assessment of learning by both teachers and specialists.

The use of the learning curve in learning assessment has been associated with these techniques. Learning curves involve repeated administration of a series of tasks. Data is recorded on a task analysis sheet over administrations and graphed. The slope of a curve indicates the rate of learning using a particular instructional approach. This method allows data based identification of learning approaches that appear to be most effective. McCray and Blakemore (1985) have described computer software based on mathematical theories of learning curves to predict maximum potential of an individual based on several administrations of tasks.

Learning assessment also involves identifying those methods by which an individual learns best—or learning style. Learning style assessment is dependent upon an understanding of the many variables that make up learning style. Many different approaches to learning styles have been developed (Botterbusch 1984; Kirby 1979; and Knaak 1983). However, the most comprehensive model has been developed by Dunn and Dunn (1984) that includes five types of elements: environmental, emotional, sociological, physical, and psychological. Environmental, for example, includes room temperature, formal versus informal design, and so forth. Physical elements include perceptual strengths related to auditory, visual, or kinesthetic/tactile. A number of learning style inventories are available. Some like the C.I.T.E. (Babish, Burdine, Albright, and Randol 1979) are informal measures that can be used easily by teachers. Others, like the Learning Style Inventory (Dunn, Dunn and Price 1984) are more formal instruments. However, all of these measures are self-report measures that indicate the perceptions of the individual regarding their preferred learning style. These are reviewed by Botterbusch (1984).

Practitioners may also assess learning styles via systematic observation of learning by the individual under various instructional and behavioral change strategies. These same ideas have not been applied in vocational education where a greater variety of instructional techniques are used. The same procedures used above to determine learning potential, particularly with those with more severe disabilities, have been used to identify most effective learning and behavioral change strategies. A systematic process for experimenting with different learning and behavioral change methods is needed that will allow more precise identification of best instructional methods. Presently, learning assessment may be conducted directly via systematic observation in any skill assessment situation and allowing opportunities for performing a task several times and receiving different types of instructions or interactional approaches. Data is recorded regarding learning curves using different approaches. Those approaches under which the individual learns most effectively would be identified as the most effective learning style of the individual (Browder 1987; Gold 1972; Schalock and Karan 1979).

Assessment of Special Needs

The Carl D. Perkins Vocational Education Act indicates that special students should receive assessment related to success in a vocational education program. Special needs can include many areas. From one perspective, a special need occurs any time that the skills or characteristics of the individual do not meet the requirements of the vocational education program. Once such a discrepancy is identified, solutions may be sought by changing the individual, curriculum adaptation and modification, and additional support services. Needs are different from weaknesses. Although the latter indicate limitations, needs focus on identifying solutions to discrepancies. Needs may also be thought of as special personal problems of an individual, for example, behavior, parental support). Again, identification of limitations leads to specification of needs that can deal with such limitations.

USE OF VOCATIONAL ASSESSMENT

A major purpose of vocational assessment is to provide meaningful experiences for students and impact on educational plans, program placement, and instruction. More specifically, for vocational education, vocational assessment should provide information that is meaningful and useful for vocational education personnel, parents, and students. A number of methods have been seen as critical in insuring that this occurs.

Involvement of Key Individuals

Use of a team approach has been highly recommended. Such a team should involve key individuals who are or may be involved with a student—special education teacher, students themselves, parents, vocational education teachers and counselors, support service personnel. Vocational assessment that is closely connected with each of these individuals will help assure use of the process and results (Albright and Cobb 1986; Neubert 1986).

Staffing and Plan Development

Similarly, both formal and informal conferences should be held with the team as decisions are being made. For handicapped students this may be identical with the I.E.P. yearly conference. A goal-oriented, functional, interdisciplinary approach is needed in the conduct of such a meeting to identify vocational goals, program placement, curriculum adaptations and support services, and the role of various individuals. The student should participate in and be the center of this meeting (Leconte 1985; Peterson 1986b).

Reports and Documentation

Virtually all professionals feel that documentation of vocational assessment results is important. However, dissatisfaction with the usefulness of reports is an important issue (Stodden et al. 1986). Thomas (1986) has provided guidelines for the development of prescriptive reports which focus on specific recommendations for goals, program placement, services, and instructional approaches.

Several practitioners have developed aids that assist in effective report development. Dick (1987) developed a "recommendations menu" composed of programs, support services, and curriculum adaptations available in their local school district. Ashley (1986) and his staff used instructional objectives for vocational education taken from the V-TECS catalog to attach to reports. Peterson (1986b) developed a report format that identified goals, programs and services, and methods of instruction and behavior change and provided a synthesis of student abilities and needs related to work skills and related independent living skills. Patten (1981a) suggested the use of special, short reports aimed at the needs of teachers, students, and parents that would summarize in one page meaningful information resulting from the assessment process. Leconte and Rothenbaucher (1987) described development of a concise but complete report printed on heavy

colored paper on two sides so that it would easily be recognized by teachers and others. Increasingly microcomputers have been used to facilitate word processing and development of reports. Albright (1982) and Stodden and Ianacone (1986) developed simple performance-oriented documentation for vocational teachers as part of the instructional process that have been adapted from competency-based vocational education approaches.

Despite these innovations, improved methods of documenting vocational assessment information are needed. This is particularly true for curriculum-based vocational assessment. Reports from commercial trait assessment systems typically generate a report prepared by a computer that gives scores on tests, summary of worker trait levels, and occupational recommendations by title and *Dictionary of Occupational Titles* number (Botterbusch 1982a, 1986). These reports have the same limitations for use in education, habilitation, and rehabilitation programming as trait assessment does in general.

Advocacy and Follow-Up

Advocacy and follow-up are critical elements to insure usefulness of the vocational assessment process. These have been described by Leconte and Rothenbaucher (1987).

Program Evaluation and Revision

Finally, methods are needed to obtain ongoing feedback about the usefulness of the vocational assessment process and outcomes. Mechanisms are needed for ongoing renewal and improvement of the process. Schneck (1980) discussed issues related to program evaluation in vocational assessment. Unfortunately, this is an area that has received limited attention. Some individuals use formal surveys to obtain feedback concerning the vocational assessment process. Leconte and Roebuck (1987) has recommended informal discussions with vocational instructors and meetings with staff to obtain feedback and suggestions for improvement. Formal systems of follow-up and program evaluation have also been developed and should be encouraged (Virginia Department of Education 1987).

Efficacy of Vocational Assessment

Interestingly, relatively few studies have been conducted on the efficacy of vocational assessment services. Those that have been conducted focused primarily on a vocational evaluation center model since curriculum-based vocational assessment and multilevel models are in very early stages of development. Nadolsky (1972) obtained feedback concerning the perceived efficacy of vocational evaluation in centers from rehabilitation counselors who indicated that the service was valuable. He later compared a systematic decision-making process of vocational evaluation with the process used by JEVS work sample system and concluded that the former process was more effective in the long run.

Some evaluation studies have pointed out significant problems in the delivery of effective vocational evaluation services (Nadolsky 1973). Gold (1972) indicated concerns about the use of vocational assessment measures that do not incorporate direct instruction as part of the assessment process, and practitioners have reported problems of severely disabled individuals being assessed as having no "vocational potential" who were subsequently successfully employed via supported employment programs (Gemmel 1987; Gold 1972; Moon et al. 1986).

Other studies have focused more specifically on vocational evaluation in school settings. Menz (1978) evaluated the results of a program in Wisconsin to at-risk youth and found that involvement in a vocational evaluation program resulted in reported improvements in attitude and behavior of students. Neubert (1986) studied the use of vocational evaluation results in three school districts and made the following conclusions: vocational evaluators played a major role in assisting handicapped students to gain access to vocational programs for the great majority of handicapped students; lack of coordination between special education and vocational education was problematic; support services in vocational education were critical in facilitating access to and success in vocational education; lack of appropriate curriculum adaptation in vocational education hindered access to vocational programs; vocational evaluation reports did not appear to be used for planning I.E.P.'s with students nor were vocational objectives included as significant components of I.E.P.'s; and recommendations from vocational evaluation were utilized when there were administrative directives or support for this to occur.

Cobb and Phelps (1983) similarly reviewed I.E.P.'s in Illinois to determine if vocational evaluation data were present on I.E.P.'s and concluded that use was limited. Repetto (1986) conducted a similar study in Missouri related to placement and assessment in vocational education programs via a survey of vocational resource educators in the state. She concluded that "students are more likely to enter business and office, machine shop, health services and marketing and cooperative education programs if they have had a formal (versus informal) vocational assessment" (p. 13).

Stodden et al. (1986) are in the process of conducting a large investigation of the effectiveness of vocational assessment in its impact and use with special education teachers. Their preliminary report indicates similarly that vocational assessment results have had limited impact on the development of I.E.P.'s for handicapped students who were enrolled in work study programs. I.E.P.'s, in fact, varied little from school to school. Needed improvements in the conduct of vocational assessment and manner in which this was communicated to teachers was also studied.

Several conclusions may be drawn from these studies and other related research in vocational assessment. First, vocational evaluation has improved access of individuals to vocational education and, in combination with other support services, can facilitate effective curriculum adaptation. Secondly, vocational evaluation has been perceived as useful by rehabilitation counselors and has positively affected student attitudes and behaviors. Vocational assessment, however, appears to have had less impact on special education curricula. Reasons for this appear to be unclear. However, these results are consistent with other efforts to refocus special education from exclusive attention to academic skills towards vocational and independent living skills. Additionally, sex stereotyping, prejudging of individuals, inappropriate assessment techniques, and limiting the range of vocational programs available to an individual can all impact adversely on the delivery of effective vocational assessment and planning. Curriculum-based vocational assessment appears to be an approach that has potential to assist in bridging the gap between assessment and instruction—particularly in special education. However, this model is yet largely untested. Finally, administrative support for including vocational objectives in I.E.P.'s and using recommendations in adapting vocational instruction for special students is necessary.

Organizing the Process of Vocational Assessment for Vocational Education

As practitioners and administrators develop vocational assessment practices in schools, they must first answer several questions: (1) What do we want from vocational assessment? (2) What methods of vocational assessment will be used to implement the process? (3) What process will we use for conducting vocational assessment and how will this process be organized? (4) Relatedly,

how will school districts work with varieties of funding sources and other agencies who may also need vocational assessment services for individuals with special needs. The first two questions have been discussed earlier in this monograph. However, various methods of organizing vocational assessment are associated with different understandings of the purposes and outcomes of vocational assessment, approaches to vocational assessment, and different vocational assessment methods.

Selection and Student Development Approaches

Organization of the vocational assessment process may vary dramatically depending upon whether a selection or student development approach is taken. Selection approaches will most often involve vocational screening centers. Typically, such programs employ individuals who test great numbers of individuals on a standard battery of tests, match individual characteristics to predetermined program criteria, and screen out those who do not meet the program criteria from access to the vocational education program. Organizational arrangements could include special testing via a prevocational class, mobile vocational assessment, and screening assessment in a vocational evaluation center. Selection approaches, by definition, also focus totally on screening individuals for program placement and provide no monitoring of student progress and student skills and interests upon the completion of vocational education programs.

Student development approaches may be implemented via any of the organizational arrangements described below as well, though some organizational arrangements may appear more conducive to student development than others. A student development approach will most often include involvement of students in vocational exploration and in real work activities, assessment of student learning styles, interests, and skills, and involvement of the student in decision making. Additionally, comprehensive student development approaches will include assessment before, during, and after vocational education programs as well as other vocational training programs (Albright and Cobb, 1986; Peterson, Brown, and Leconte, 1987).

Interprogram Collaboration in Vocation Assessment

Another important issue related to the organization and administration of vocational assessment services is the degree to which vocational assessment is designed so that it may be appropriate for the needs of various vocational programs and agencies. A variety of programs for special needs individuals may need vocational assessment information. These include but are not limited to vocational education, community-based special education, supported employment programs, vocational rehabilitation, community-based rehabilitation programs such as rehabilitation facilities, Job Training Partnership Act (JTPA) programs, and others. Cobb (1985), Leconte (1985), and Peterson (1985b) have advocated vocational assessment processes that could be used by all agencies and programs in a cost-effective manner. In a review of exemplary interagency programs in transition from school to work, Ballantyne et al. (1985) stated that vocational assessment worked as a broker of services between agencies and facilitated selection of the most appropriate transition service path for students.

A review of program descriptions in the literature and discussions by the author with professionals throughout the country have revealed a tendency to design and implement vocational assessment to serve the program needs of one agency only. This approach often results in separate vocational assessment processes for each major agency. Frequently, students must be assessed separately by each program. For instance, a vocational assessment procedure might indicate that vocational education is not appropriate for a student. A referral for vocational rehabilitation services may then be initiated where the student would be required to participate in another vocational evaluation to design services for the student.

Methods of Organizing Vocational Assessment

A variety of methods for organizing and administering vocational assessment for vocational education have been used throughout the country and proposed in the literature. These include curriculum-based vocational assessment, vocational assessment via special prevocational or vocational exploration classes, vocational evaluation centers, vocational screening centers, and a comprehensive, multilevel approach.

Curriculum-based Vocational Assessment

Curriculum-based vocational assessment may be thought of as an assessment process in which the curriculum is both the focus of assessment and source of assessment information about students. From one perspective, curriculum-based assessment is a relatively new concept as a mechanism for conducting the formal, legal requirements of special education assessment (Tucker 1985; Galagan 1985). From another perspective, curriculum-based assessment is as old as teaching itself since instruction necessarily involves ongoing assessment of the student related to curriculum objectives. Recent developments in curriculum-based assessment, however, attempt to pay systematic attention to technical concepts of reliability, validity, and other issues on which teacher-based assessment has been considered weak in the past. Personnel in rehabilitation have developed similar concepts related to functional assessment (Halpern and Fuhrer 1984) as have professionals in functional and community-based special education (Browder 1987).

If curriculum-based vocational assessment is closely associated with the curriculum of the student, the question must be asked, "What curriculum?" This may include the total formal curriculum of the school in which the student participates, informal activities associated with the school and the community (e.g., extracurricular activities), and curricula in particular classes or programs (e.g., vocational education, industrial arts, English, a prevocational program). In curriculum-based vocational assessment, it appears important that an overall profile of student development be obtained with input from a variety of activities (curricula) in which the student is involved. This provides a method of "linking" together assessment information related to specific programs or classes so that a total, comprehensive picture of the student is obtained. Secondly, assessment for entrance into, progress in, and outcomes for each curriculum component is obtained.

In this context, the Division for Career Development (DCD) (Sitlington et al. 1985) developed a position paper on career/vocational assessment. They stated that career assessment "should be a foundation for individualized program planning from kindergarten through adulthood" related to future roles in work, home, and community situations. Although DCD did not endorse any organizational process, the authors did indicate that "the assessment sequence should parallel the career programming sequence developed for each individual and should provide the information needed to make decisions in this program" (Sitlington et al. 1985, p. 4). This framework supports use of curriculum-based vocational and career assessment in which longitudinal assessment of student interests, skills, and special needs is obtained via a variety of sources.

According to Cobb and Danehey (1986), curriculum-based vocational assessment for vocational education includes the following characteristics: assessment tied directly to the vocational education program; instructional personnel involved in the assessment process; use of informal and direct assessment methods; and a continuous process of assessment before, during, and upon completion of the vocational program.

Most writers who discuss curriculum-based vocational assessment focus on assessment prior to, during, and upon completion of the vocational program. However, Stodden and Ianacone (1986) developed a model of curriculum-based vocational assessment in which vocational teachers provided ongoing assessment during and upon completion of a series of vocational exploration and skill development programs.

Disagreement is also apparent regarding whether vocational assessment specialists are involved in a curriculum-based assessment process. Peterson (1985b) and Sitlington et al. (1985) discuss the need for a curriculum-based career assessment coordinator. Cobb (1985) and Stodden and Ianacone (1986), however, have stated that assessment should be associated only with instructional personnel. These writers have especially expressed concern regarding the tendency for assessment specialists to provide assessment that is separate from and less relevant to the vocational education curriculum.

Special Prevocational and Vocational Exploration Classes

Vocational assessment may be set up as part of a prevocational or vocational exploration class. Typically, in this arrangement, students are involved in prevocational skill development, vocational exploration, and career-decision activities. A variety of assessment methods are often associated with this type of program. Some use vocational screening aptitude tests and vocational assessment systems. Others use work, real or simulated, by involving students in in-class work activities, exploration in vocational programs, and on-the-job exploration and assessment. Cobb (1985) has advocated such programs associated with vocational technical centers to insure that vocational exploration and vocational assessment are closely connected with the vocational classes. Menz (1978) recommended this type of approach as a method of adapting vocational evaluation centers for inclusion in the public schools.

Vocational Evaluation Centers

Vocational evaluation centers are typically separate, centralized centers where intensive, time-limited vocational assessment is provided. Typically, such centers are staffed by a "vocational evaluation specialist" who may coordinate and/or conduct actual assessment and compile the information into a report that can be used by others in developing individualized education plans. Vocational evaluation centers are most often involved in vocational assessment of students prior to vocational education.

As administrators have attempted to respond to requirements for vocational assessment of special students, a typical response has been to develop a vocational evaluation center staffed by an individual whose job is to assess students, write reports, and facilitate use of assessment results. These programs often use commercial vocational evaluation systems. In Ballard and Leconte's (1987) study, several states reported the establishment of "vocational assessment units" as part of their compliance with the Carl D. Perkins Vocational Education Act. Vocational evaluation centers are visible. As an "added" service they do not require redistribution of job duties and reformulation of assessment processes in the school as a whole as does curriculum-based vocational assessment.

On the other hand, vocational evaluation centers have been increasingly criticized in recent years. The reasons for this criticism include (1) reliance on commercial vocational evaluation systems that do not relate directly to the vocational education program (Peterson 1986a), (2) use of an assessment process that does not account for learning and support systems in vocational education programs (Gold 1972), (3) separation of the vocational assessment process from those who

will actually use that process (Cobb 1985), and (4) limited usefulness of vocational evaluation reports in programming for students (Stodden et al. 1986).

Although these criticisms often appear valid, writers appear to have confused issues related to organizational structure with the process that is actually used in vocational evaluation centers. In other words, utilization of a special center staffed by a specialist in vocational assessment of students does not necessarily imply the problems listed above. Evidence is available to indicate that use of good practices in vocational evaluation centers can provide substantive assistance to special students in vocational education programs (Leconte 1985; Neubert 1986; Repetto 1986).

Vocational evaluation centers vary tremendously in their organization and the process of vocational assessment that they use. Part of the confusion in the field appears to result from the lack of recognition that a "vocational evaluation center" is simply a term to imply centralization of resources related to vocational assessment of special students. However, the manner and effectiveness may vary greatly. Typical models and approaches to vocational evaluation centers are listed and briefly described in the following paragraphs. These include vocational screening centers, center-based vocational evaluation, integrated vocational evaluation centers, a combination of center-based, integrated, and mobile vocational assessment centers.

Vocational screening centers. This approach to a vocational assessment center typically uses one or more vocational evaluation systems designed to provide brief assessment of great numbers of special students. Such centers will typically use aptitude tests or aptitude assessment commercial work samples. Such programs provide little, if any, vocational exploration, limited vocational counseling, and are most often totally segregated from the actual vocational education program. Instruments used often have only limited applicability to the vocational education program (Peterson 1986a).

Some states have adopted vocational screening centers as one phase of a multilevel process of vocational assessment. Texas (Texas Education Agency 1979), for instance, identified three "levels" of vocational assessment: (1) use of existing information, (2) aptitude and interest assessment, and (3) comprehensive vocational evaluation. Virginia (Virginia Department of Education 1987) and other states have adopted a similar model.

Center-based vocational evaluation. This type of vocational evaluation center provides assessment totally within the confines of a special physical setting using a variety of psychological tests, aptitude tests, work samples, and other techniques. Such centers themselves may vary greatly, however. Some may use both locally developed and commercially available work samples and simulations that attempt to closely replicate work activities and have high face validity. Other centers may rely primarily on the assessment of aptitudes and other worker traits using a variety of abstract tests and work tasks that have limited face validity and provide limited opportunities for vocational exploration.

Integrated vocational evaluation center. The term "integrated vocational evaluation center" describes a center where assessment and exploration activities occur primarily outside the physical facilities in which the vocational assessment specialist is housed. In this approach, students would participate in situational assessment activities in vocational classrooms, tryouts in community jobs, and other community-based activities. "Integrated" simply conveys the idea that assessment is integrated into the school and community environments in which vocational skills are actually used. Such programs provide high degrees of face validity, potential for close connection with the vocational education curriculum, and significant opportunities for vocational exploration. In such situations, the vocational assessment specialist may act as a coordinator and manager of the assessment process. This approach to vocational evaluation centers is very similar to that used in curriculum-based vocational assessment as previously described.

Combination of center-based and integrated. In this approach, some tests, vocational information and exploration, and other experiences are provided in an actual center and via situational assessment in school and community settings as well. Nadolsky (1973) developed a process model of vocational evaluation that has provided a model for the field that incorporates this combination approach. In this process, the initial stages involve interviews and general psychological tests to provide some parameters for interests, abilities, and special needs. Subsequently, an individual is given opportunities for assessment via work samples related to specific occupational areas. As hypotheses concerning the "ideal vocational objective" are formulated, the individual participates in actual job or vocational classroom settings to confirm these hypotheses and to select among various options.

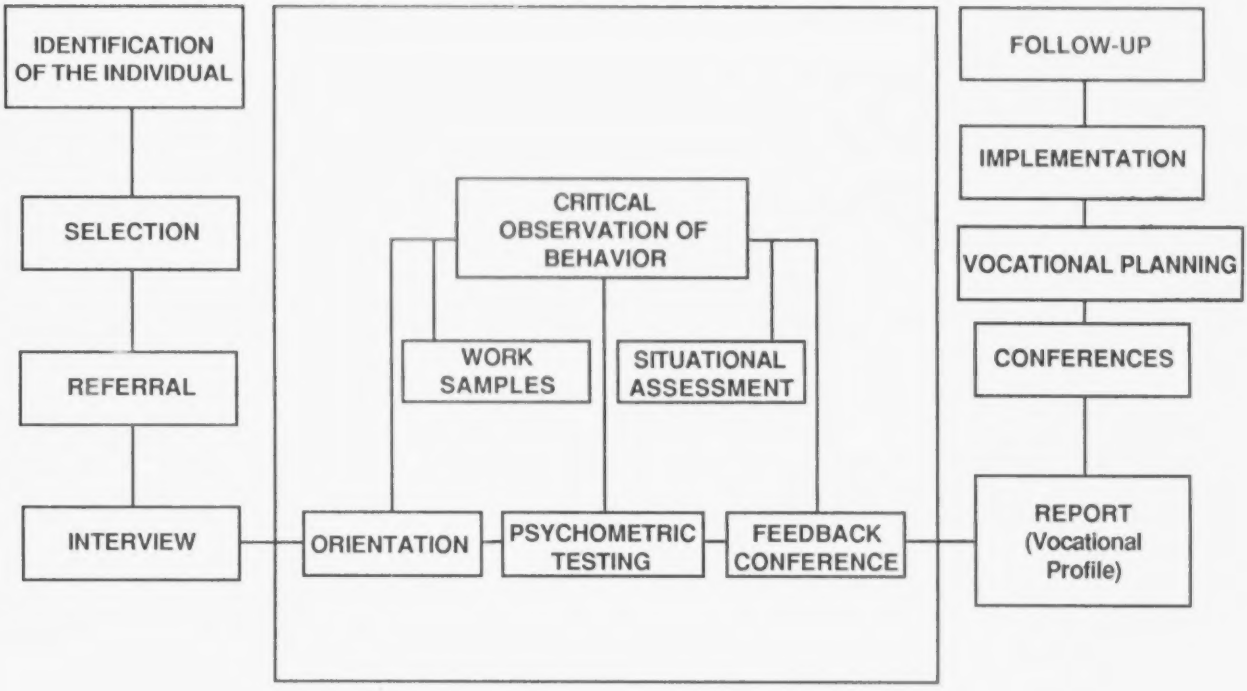
Leconte and Roebuck (1987) described an adaptation of this process that has been used in vocational evaluation centers in Maryland and is illustrated in figure 7. In her model, critical observation of behavior is important in all aspects of the vocational assessment process. In vocational education, this combined model appears to draw on the strengths of formal assessment and systematic situational observation in the actual vocational education curriculum. Such an approach to vocational evaluation may be very similar to special prevocational or occupational exploration classes as previously described. If such programs are located in the same building as the vocational programs, close coordination between the assessment process and the vocational programs is possible. A number of exemplary vocational assessment programs in vocational education have used this approach (Anderlini and Zittel 1982; Jones 1979; Linari and Brown 1979; Maryland State Department of Education 1977; Patten 1981a and 1981b; Paulsen 1980; Schmitz 1974).

Comprehensive, multilevel approach. Several writers have developed multilevel approaches to the organization of vocational assessment that allow for more intensive student assessment as these resources are needed. These approaches vary primarily in their reliance on vocational assessment aptitude tests. As previously described, Texas (Texas Education Agency 1979) developed a model that has been adapted by several states and includes three major components: (1) utilization of existing information, (2) aptitude and interest testing, and (3) comprehensive vocational evaluation. Virginia (Virginia Department of Education 1987), Arizona (Posey 1982), Colorado (Lehmann and McAlonan 1985), New York (Neville 1986), Illinois (Illinois Department of Education 1987), and Pennsylvania (Pennsylvania Department of Education 1983) are among the states that have used a similar approach.

Peterson and Hill (1982) developed a manual on this approach that included two major components: basic vocational assessment consisting of existing information, curriculum-based vocational assessment, and aptitude and interest tests; and comprehensive vocational evaluation via vocational evaluation centers.

Lehmann and McAlonan (1985) developed a handbook based on a similar approach for Colorado that included screening assessment and specific vocational assessment. Screening assessment, in their model, is much like "basic vocational assessment" as described by Peterson and Hill (1982) and includes special education and school assessment information; interview with the individual and parents; observations of significant others; and aptitude, achievement, and interest tests if needed. Specific vocational assessment involves more intensive methods of assessment including a variety of tests, work samples, and situational assessment.

More recently Peterson (1986b) has adapted this model for vocational education to combine the strengths of the multilevel approach curriculum-based vocational assessment and certain models of vocational evaluation. This model, described graphically in figure 8, includes three levels of vocational assessment prior to entry into the vocational program: (1) curriculum-based career assessment drawn from ongoing observation and monitoring of student work, home, and

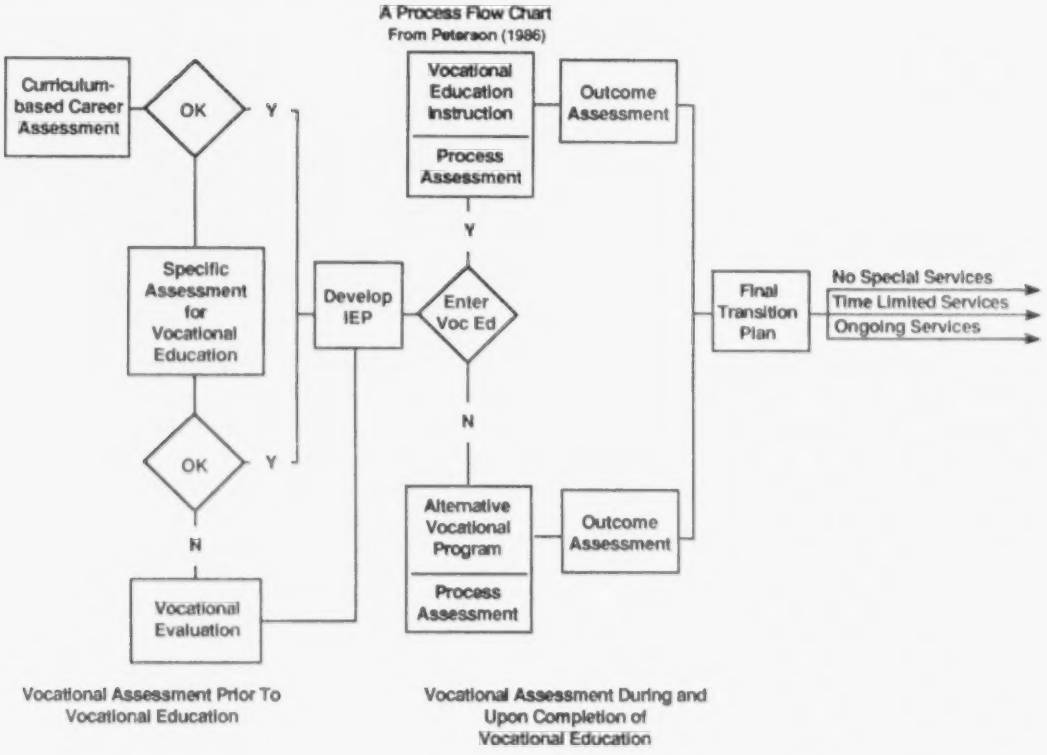


SOURCE: Reprinted, by permission of the authors, from P. Leconte and E. Roebuck, "Methodologies Used in Vocational Assessment and Vocational Evaluation Process," 1987.

Figure 7. Vocational evaluation process

community skills and interests via functional and community-based special education curricula; (2) specific assessment related to the vocational education program via activities in vocational classrooms themselves (interviews with the teacher, performance assessment, etc.); and (3) comprehensive vocational evaluation using an integrated or combined model of vocational evaluation. At the first level, teachers, parents, and students themselves would provide assessment information with assistance from support personnel such as school psychologists, vocational evaluation specialists, or vocational counselors. Specific assessment would be provided by support service personnel for special students in vocational education such as Designated Vocational Instructors in Wisconsin (Wisconsin Department of Public Instruction 1985) or by special vocational Evaluation Specialists as part of comprehensive vocational evaluation as used by the Vocational Support Service Teams (VSST) in Maryland (Maryland Department of Education 1984).

The VSST model also includes vocational assessment of progress in the vocational classroom conducted by the vocational teacher with assistance as needed by vocational support service personnel.



SOURCE: Peterson (forthcoming)

Figure 8. Vocational assessment for vocational education

Each of these comprehensive models of vocational assessment is intended to provide a mechanism for organizing and linking all parts of developmental career and vocational assessment; utilize systematic observations of individuals in work, home, and community situations by a wide variety of individuals as the primary assessment method; and provide a method for assessing large numbers of individuals in a manner that is consistent with best practices and allows for more intensive and formal assessment as needed. This revised multilevel model recommends that aptitude tests not be used since they provide little new information that is not already available elsewhere via school records, academic tests, and teacher ratings of aptitudes. Instead, experiential techniques that involve the student in vocational activities in the vocational classroom or community are recommended.

Multilevel approaches have been implemented by some practitioners. Patton (1981a) described a program that incorporated the observations of a wide variety of educators with formal vocational evaluation if needed. Dick (1987) further described a similar process used in the public schools in Kansas City.

Community-based Vocational Assessment

Community-based vocational assessment refers to a method of implementing vocational assessment in which community work and community situations are used as the focal point of assessment. In one sense, community-based vocational assessment refers to a cluster of vocational assessment techniques and methods rather than a method of organizing the process. As was discussed earlier, community-based observations can be a part of virtually all methods of organizing vocational assessment—particularly through curriculum-based vocational assessment (assuming that the curriculum includes community-based education) and vocational evaluation centers that use an integrated or combination approach. Although community-based vocational assessment has been used for many years, it has become especially important as part of the vocational assessment process in supported employment programs and community-based special education (Browder 1987; Callahan 1987).

Criteria for Selecting Methods of Organizing Vocational Assessment

Since many procedures are available for organizing vocational assessment, criteria based on best practices are needed. Additional research is needed regarding best methods of organizing the process of vocational assessment. However, evaluation studies do indicate that many of the organizational frameworks above can provide effective and useful services and can identify several characteristics of effective vocational assessment that are applicable across organizational frameworks that use a student development rather than a selection approach.

Outcome focused. The effectiveness of vocational assessment must be carefully evaluated to see if it is useful. Vocational assessment should clearly assist students in vocational development; the manner in which vocational assessment is delivered should be adjusted based on the ongoing outcome and process evaluation of vocational assessment (Schneck 1980).

Relevant to the curriculum. Relatedly, vocational assessment should be closely connected to vocational education curricula. Both the process and the results of vocational assessment are seen as useful to vocational teachers, special education teachers, and others who work with the student in vocational education (Cobb 1985; Halpern et al. 1982).

Student guidance. In most effective vocational assessment processes, the student is an active participant in the process. Activities are designed to assist the student in learning, changing behavior, improving decision-making skills, and making vocational decisions. Consequently, there is typically an emphasis in exemplary programs in involving the student in real work activities for vocational exploration and providing feedback, counseling, and guidance as part of the assessment process. Thus, for exemplary student development, vocational assessment is not simply a testing procedure but a process of intensive vocational assessment and guidance (Leconte 1985; Nadolsky 1973).

Curriculum Adaptations and Support Services

Effective vocational assessment will include processes by which curriculum adaptations and support services needed in vocational education may be identified. This often involves analysis of skill requirements of the vocational program and teaching methods of the vocational instructor as well as assessment and experimentation with learning styles and modalities of the individual.

Perhaps a key criterion identified in the literature for an effective process of vocational assessment is active advocacy to facilitate implementation of recommendations from the vocational assessment process. Cobb (1985) described an effective vocational assessment specialist as an individual who would not only coordinate gathering assessment information but would actively facilitate the entrance and success of special students in the vocational program.

Leconte and Rothenbaucher (1987) described a number of services related to both advocacy and curriculum adaptations and support services as used in the Vocational Support Service Teams (VSST) in Maryland that include student support via counseling, tutoring, and peer counseling; instructional assistance; instructor assistance via consultation, adaptation of curriculum; ongoing assessment and monitoring of student needs and progress; liaison and linkages with family and agencies; advocacy and follow-up to insure that services for the student are implemented; and assistance in transition to employment and services by other agencies.

A danger in formal assessment procedures is that the end product of vocational assessment may be seen as the production of an assessment report. According to criteria in exemplary programs, reports are but one mechanism to facilitate access to and implementation of services via vocational education. The process of advocacy may take many forms but especially includes the following: concise but complete written reports; formal "staffings" in which individual plans are developed with parents, students, educators, and other relevant professionals; informal conversations and assistance in person or via telephone with vocational instructors; informal and formal advocacy with administrators to obtain support for implementing recommendations resulting from vocational assessment (Leconte and Rothenbaucher 1987; Maryland State Department of Education 1984; Peterson and Petersen 1986).

Documentation

All forms of effective vocational assessment include methods to document student skills and recommendations for vocational education and support services.

In vocational assessment, research has typically focused on a specific assessment method or tool. However, research related to the **process** of vocational assessment is virtually nonexistent. Consequently, we do not have research data that discusses the efficacy of combinations of methods, ordering of methods and techniques, methods of providing feedback to students, and so forth. The criteria for process are presently based primarily on case studies, descriptions of common characteristics of exemplary programs developed via the experience of practitioners, and research and analysis that points towards what **not** to do.

Professionals in assessment centers in business and industry have set a model for future research in vocational assessment of social students by focusing on the total process as well as the contributions of individual methods to that process. One of the important results of that research has been the discovery that when certain processes are used, the results have high predictive validity despite the fact that any one method in the process may show low validity. Out of such research, program standards have been developed (Keil 1981; Thornton and Byham 1982). Similar research related to the processes of organizing and implementing vocational assessment with special students is needed.

Personnel in Vocational Assessment

Personnel issues in vocational assessment have been discussed in rehabilitation and vocational special needs literature. Several questions are important. Who is responsible for conducting coordinating, and designing the vocational assessment process? What roles should various individuals play in gathering and using vocational assessment information and experiences? How does vocational assessment relate to the special education process and how does this affect the roles of other assessment personnel? What are the skills needed by individuals involved in the process? What training should be provided and how? Finally, what, if any, special provisions for certification should be developed? Each of these issues will be briefly discussed below.

Personnel Involved in Vocational Assessment

The method by which the vocational assessment process is organized will greatly affect the identification of personnel involved in the vocational assessment process. Each major model is discussed below.

Curriculum-based vocational assessment. In CBVA, implementing vocational assessment is primarily the responsibility of the teacher. If curriculum-based assessment of vocational characteristics begins at a young age as advocated by some (Brolin 1986; Browder 1987; Peterson 1986b), special education teachers will be primarily responsible with assistance and involvement by school psychologists or related support services personnel (Hohenshil 1984; Hohenshil, Anderson, and Salwan 1982; Sitlington et al. 1985).

When a student is involved with vocational education, however, vocational assessment may be continued by vocational instructors (Albright 1982; Albright and Cobb 1986) with the assistance of vocational support personnel such as designated vocational instructors in Wisconsin (Wisconsin Department of Public Instruction 1985), related vocational instructors in Georgia, or vocational special needs counselors in Mississippi.

Writers disagree concerning whether a "vocational assessment specialist" is needed to assist in developing and coordinating this process. Sitlington et al. (1985), writing for the Division for Career Development of the Council for Exceptional Children, stated that an individual trained in vocational evaluation is needed at the secondary level and discussed the qualifications of an individual who might coordinate career assessment at the elementary level. Peterson (1985b) recommended that an individual be designated as a curriculum-based vocational assessment coordinator to be "responsible for coordinating the design of the overall curriculum-based vocational assessment process and training team members in its use" (p. 42). Such a "function does not necessarily require a full-time position but may well be part of the job description of a lead special education teacher, counselor, school psychologist, or a vocational evaluation specialist" (Peterson 1986b, p. 42). Cobb (1985) and others (Hohenshil 1984) have indicated that such an individual is not needed.

Vocational evaluation centers. Vocational evaluation centers are typically staffed by individuals with specific training in vocational assessment. Again, depending upon the model of vocational evaluation center used, other individuals may be involved. Integrated and combined models, as described above, would involve observations of teachers, parents, counselors, and community members. Vocational education teachers, particularly, may be involved in vocational interviews, tours, performance samples, and vocational classroom tryouts. On the other hand, totally center-based programs may involve primary if not total responsibility for vocational assessment on the part of the vocational evaluation specialist. The literature highly supports the use of a team

approach to vocational assessment. Research data indicate that multiple observations increase reliability and validity of observational judgments (Thornton and Byham 1982). Many individuals have called for a team approach in vocational evaluation, regardless of the model being used (Francis 1980; Patten 1981a,b; Posey 1982). Similar types of issues exist for any type of special program in which vocational assessment is conducted, including prevocational and vocational exploration programs.

Multilevel approaches. Multilevel approaches that include both curriculum-based vocational assessment and vocational evaluation centers will include all the individuals described above in the assessment process. One of the critical tasks in developing an overall process for vocational assessment in schools is to identify clearly who will be involved in the assessment process and their roles and to obtain administrative support.

Team approach to vocational assessment. The literature highly supports the use of a team approach to vocational assessment. Research data indicate that multiple observations increase reliability and validity of observational judgments. Assessment centers in business and industry, for instance, require two trained observers on any assessment exercise and attempt to pool the observations of several persons (Thornton and Byham 1982). Many individuals have called for a team approach in vocational evaluation, regardless of the model being used. Consequently, the use of single individuals who give tests, interpret results, and write reports appears questionable.

Personnel Training in Vocational Assessment

Given the need for vocational assessment of special students and the many individuals, particularly teachers and vocational assessment specialists, who are involved in the process, training in effective methods of vocational assessment has increasingly been identified as a priority need. In 1932, 23 states indicated plans to increase training related to vocational assessment of special students (Peterson 1985). Ballard and Leconte's (1987) review of vocational education state plans identified several states as providing inservice training in vocational assessment. Anecdotal evidence supports the conclusion that states are in fact increasing their efforts to provide inservice training in vocational assessment to better meet the mandates of the vocational education act.

Increasing numbers of universities are beginning to offer undergraduate and graduate coursework in vocational assessment of special students. Over the last 20 years graduate programs in vocational evaluation have been initiated primarily in programs associated with vocational rehabilitation supported by grants from the Rehabilitation Services Administration (Fry 1986). In recent years, however, funding has been cut from those programs based on the apparent concern with vocational evaluation professionals who used trait assessment approaches to limit the potential of individuals with severe disabilities.

Gradually, vocational assessment courses have been added in special education, vocational education, and educational psychology departments in universities. Peterson (1986c) conducted a national survey of vocational special needs educators of whom 16 reported that they had one or more courses in vocational assessment. To date, some three universities offer a specialization in vocational assessment associated with a degree in vocational special needs. Clearly, special education and vocational education teachers, counselors, special support service personnel, as well as vocational assessment specialists, need training in effective vocational assessment techniques. Vocational and functional assessment must become integrated into university curricula for such individuals. The degree to which this may happen in the near future, however, is highly uncertain.

Training materials also are needed to facilitate personnel preparation in vocational assessment. Presently, the greatest source of training materials is the Materials Development Center at the University of Wisconsin-Stout. However, some of these materials do not meet the specific needs of school-based vocational assessment personnel. Individual trainers, university programs, and individual projects have developed some manuals (Peterson 1986a). However, effective audio-visual training materials in curriculum-based vocational assessment, experiential assessment techniques in vocational education classes, and other important techniques reviewed in this monograph are presently not available. Additional resources in developing quality training materials is critical if personnel development in vocational assessment is to be effective.

Personnel Competencies in Vocational Assessment

Competency studies for vocational evaluation specialists in rehabilitation have been conducted (Coffey, Hansen, Menz, and Coker 1978; Sink, Porter, Rubin, and Painter 1979). However, these studies do not reflect current developments in the field related to functional assessment, rehabilitation engineering, supported employment, learning assessment, and other areas. Competency listings are beginning to be developed for school settings for personnel associated with various organizational models of vocational assessment. Albright, Cobb, and Saferik (1986) have developed an extensive competency list related to their model of curriculum-based vocational assessment that is forming the basis for training modules. Williams (1987) recently conducted an informal national survey of competencies important in vocational assessment of special students. Leconte (1985) reported a list of competencies for vocational evaluation specialists in Maryland. Additional research appears needed concerning personnel competencies important for delivery of exemplary vocational assessment services.

Certification and Personnel Standards

Finally, personnel standards for vocational assessment are an important issue. The Division for Career Development of the Council for Exceptional Children (Sitlington et al. 1985) has recommended that professionals responsible for coordinating the career assessment process should have appropriate training in career development and informal assessment at the elementary level and meet "the minimal standards of preparation in the area of vocational evaluation at the secondary level" (p. 5). Requirements for training in vocational assessment are far from being included in the certification requirements for special educators, vocational educators, vocational counselors, and school psychologists.

Some efforts have been made to develop certification procedures for vocational evaluation specialists in various states (Peterson 1985a). However, success has been limited to date. Noll (1978) reported results of a study that indicated that vocational evaluation specialists with graduate degrees but lacking teacher certification were ineligible for employment in schools, whereas individuals with minimal training were being hired. Such requirements, according to McCarthy and Leconte (1984) reduce the number of trained vocational evaluators in schools and reduce their effectiveness due to inappropriate barriers.

In 1981 a commission was formed via impetus by the Vocational Evaluation and Work Adjustment Association (VEWAA) to develop national professional certification procedures for vocational evaluation specialists in all employment settings. Since that time, a certification process has been initiated that sets basic standards of education, training, and skill development (CCWAVES 1986). Proposals have been initiated in several states to base state certification/licenser of vocational evaluation specialists in schools upon the CCWAVES professional certification procedure. The Divi-

sion for Career Development (Sitlington et al. 1985, p. 6) has committed to "integrate standards for public school personnel who are coordinating the career assessment process into those developed by the Commission on Certification of Work Adjustment and Vocational Evaluation Specialist."

Professional Organizations in Vocational Assessment

Since so many different types of personnel are involved in vocational assessment, the development of a voice regarding vocational assessment issues via professional organizations has been problematic. The Vocational Evaluation and Work Adjustment Association (VEWAA) was formed as a division of the National Rehabilitation Association and has been the primary organization that has worked to develop vocational evaluation as a field. However, VEWAA has focused its attention heavily on rehabilitation facility settings. Other organizations that have a school base have initiated committees or task forces related to vocational assessment. These include the Division for Career Development of the Council for Exceptional Children, the National Association of Vocational Education Special Needs Personnel, and the National Association of School Psychologists. In 1984, the National Association of Vocational Assessment in Education (NAVAE) was formed as a special interest group of the Special Needs Division of the American Vocational Association.

IMPLICATIONS AND RECOMMENDATIONS

The potential for vocational assessment to be an effective part of the service delivery system of vocational education and other vocational services for special students is great. However, significant improvements in the design, implementation, and use of vocational assessment in vocational education are needed if this potential is to be realized. This monograph has reviewed the state of the art of vocational assessment as perceived by the author. Out of this review a number of recommendations and needs related to research, development, and policy development are apparent. These are the following:

- A consistent system for analyzing vocational education program requirements and adaptations is needed. A database of requirements among similar programs might be developed that could be updated for local program users. Behaviorally anchored rating scales for assessment of students on those skills are needed to use as a basis for observational assessment in a variety of situations.

- Effective, valid, and reliable performance sample exercises are needed that can be implemented in the context of a vocational education program using existing materials and that assess students on relevant skills.

- Improvements in descriptions of information about individuals and their experiences are needed. A project that would synthesize and correlate categories of information about individuals to develop a vocational profile consistent with best practices is needed.

- Research is needed regarding improvements in the overall process of vocational assessment and decision making. Which clusters of methods are most useful, used in what order? What are the most effective decision making processes? How can assessment data best be integrated into individualized planning processes?

- Additional research is needed to clearly identify those best practices that enhance the effective implementation and use of the vocational assessment process.

- Various organizational models of vocational assessment need to be tested and systematically evaluated as part of this process.

- Interprogram design and use of a vocational assessment process is needed. This necessarily involves coordinated policy considerations by special education, vocational education, rehabilitation, manpower, and mental health/mental retardation agencies.

- Identification of personnel roles, competencies, and standards is needed as are policies of the relevant agencies that will encourage or mandate appropriate personnel skills in the delivery of vocational assessment.

CONCLUSION

This monograph has reviewed many issues in vocational assessment of special students in vocational education. Vocational assessment can be a powerful tool in working with students with special needs. However, it also can represent just one more test to put in a file cabinet. It is hoped that this discussion is helpful in clarifying issues so that the potential of vocational assessment for students may be fulfilled and its pitfalls avoided.

APPENDIX

INDIVIDUAL VOCATIONAL PROFILE

The following is information needed to make the most effective decisions with students. Note that much of the information can be obtained informally and that assessment involving students in real community and work situations is stressed.

Identification Information

Name, address, disability, present living and social situation, significant personal life history

Vocational Choice Profile

General interests, needs, and values; interpersonal and social preferences, reinforcers; preferred types of activities, etc. Vocational awareness and experiences, vocational interests, preferred types of activities, family preferences and plans, preferred social situations, opportunities available locally, vocational planning skills

Vocational Support Systems Profile

Support that will assist an individual in entering and maintaining employment including personal connections for employment, support of family and significant others for employment, access to professional employment support services (e.g., job trainers, support services in vocational education, etc.)

Basic Skills Profile

Basic skills include basic cognitive, affective, and psychomotor skills needed to engage in many tasks. These are often described in various trait and skill systems in various categories.

Functional Academic Skills

Includes functional application of basic reasoning and academic skills to include the following skill areas: (1) reasoning, retaining information, generalization, verbal reasoning, problem solving, planning; (2) communications skills including the ability to listen, understand, and express oneself using written and oral language or alternative forms of communication; words and meanings; reading; writing; speaking; listening; alternative communication methods; higher levels of communications—e.g., negotiation, coordinating, teaching; and (3) mathematics skills including whole numbers, fractions, time telling; higher level math skills.

Learning Skills and Style

- Learning potential for functional work, home, and community tasks
- Learning rate
- Learning style and modality

Personal Adjustment Skills

- Self-concept
- Self-awareness
- Needs and reinforcers
- Responsibility
- Coping skills in dealing with stress
- Personal difficulties and problems—includes a variety of problems and needs to include excessive drinking, self-stimulation, acting-out behaviors, etc.

Interpersonal Skills in Work, Home, and Community Situations

- Compliance Skills (Awty et al. 1987): control of disruptive behavior, conformance to interpersonal rules
- Basic Interaction Skills (Awty et al. 1987): social amenities (Halpern et al. 1982); interaction with supervisors and other authority figures; interaction with peers; interaction with customers and members of the community
- Relationship Building Skills (Awty et al. 1987): develop friendships, develop social support networks
- Sexual Behavior

Functional Physical Skills

- Strength
- Gross motor skills and capacity
- Fine motor skills
- Sensory skills—vision, hearing, and touch
- Health
- Special physical limitation/environmental factors
- Motor vehicle operation

Work Skills Profile

Skills to Obtain and Enter Employment

Includes present abilities and potential to learn job keeping skills—job identification, obtaining interviews, applications and resumes, interviews, job networking, etc. This information is used to plan a specific approach to job placement for the individual—e.g., job seeking skills, selective placement, supported employment

Vocational Task Performances

Tasks are identified related to specific positions. Identify specific tasks needed in each environment or subenvironment applicable to the position. If the analysis relates to a training program (like a vocational education class), this section would include learning activities involved in the curriculum.

- Core task performance
- Extension performance
- Enrichment performance

Tools, Equipment, and Machinery Work Habits and Behaviors

Includes formal and informal rules of behavior for work environments. Informal rules include unspoken, but tacitly understood, expectation that most often includes: appropriate appearance and personal hygiene (Awty et al. 1987). Formal rules relate primarily to work hours, breaks, safety behaviors, and regulations. If multiple environments, or types of environments, are involved in a role or position, formal and informal rules may be identified for each of these.

- Punctuality
- Grooming
- Expected work attire
- Attendance
- Understand and follow safety rules
- Attention to tasks and work continuity
- Health code requirements
- Informed consent and legal requirements (Brown 1986)
- Related survival skills: transportation; time-telling and time judgment (Brown 1986); basic money management
- Specific rules—e.g., hair length, chewing gum, compensatory leave, etc. (Brown 1986)
- Response to change
- Production rate
- Quality of work (Roessler and Bolton 1983)

Work Adaptations and Accommodations

Identify likely adaptations or accommodations needed based on the following:

- habits, idiosyncrasies, routines
- physical/health restrictions and limitations
- behavioral challenges (Callahan 1987)
- limitations in learning

Source: Peterson (forthcoming)

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